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MANUAL
OF
FIELD GARDENING.

BEIGIAN AGRICULTURE EXPLAINED,
OR
ROUTINE OF CERTAIN FIELD GARDEN OPERATIONS
AS PRACTISED
In Sussex and Yorkshire,
In 1843 and 1844,

AND EXPLAINED BY NOTES AND OBSERVATIONS.

"The cultivation of the soil is the parent of all manufactures."

Montaigne.

"Celebrate the earth, that you may have wealth in corn, and wine, and oil, and fruit; multiply your flocks to the utmost, that you may be enriched by their milk, and clothed with their wool; and it will then be impossible that you should be poor."—*Proverbs.*

THE SECOND EDITION.

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ERRATA.

- Page 3, from line 25 to Page 4, line 11, when the word
"excretions" occurs, read "excrements."
Page 12, line 22, for "amounts" read "amount."
Page 27, line 31, for "25" read "20."
Page 27, line 27, for "course" read "coarse."
Page 33, line 5, for "first," read "fresh."
Page 49, line 45, for "into a high ridge" read "aloft."
Page 51, line 10, after "best" read "one."
Page 53, line 37, for "small" read "one acre."
Page 79, line 35, for "i. e. alkaline, salts" read "alkaline salts."

[ENTERED AT STATIONERS' HALL.]

PREFACE TO THE SECOND EDITION.

THIS small publication, of which a second, and it is believed an improved edition, is now presented to the public, consists of a Diary, or record, for one year, of the farm labours of several small cultivators, together with some notes and observations, which have been added with the view of leading persons possessing a moderate share of intelligence, into a rational practice of husbandry.

The reader's attention is particularly invited to the Diary of the Sussex cultivators. It has been compiled from certain weekly returns made by them to F. THYNNE, Esq., and which were regularly transmitted by him for the guidance of the Managers of Agricultural Schools established at Slaithwaite and Farnley Tyas, and the model farmers upon the Yorkshire estates of the EARL OF DARTMOUTH. Under the kind patronage of the noble Earl; by thus conveying sound instruction; by promoting stall-feeding and spade-husbandry; and by liberal encouragement, he, assisted by local committees, has been enabled to effect improvements in cultivation, as striking as they are gratifying and satisfactory.

Since the first edition was published, the labouring agricultural poor have lost a steady, and never tiring friend, in MRS. DAVIES GILBERT, the lady of the late President of the Royal Society, who, before she was removed hence, felt the warmest interest in the good work above-mentioned. But however greatly we may deplore her loss, the more ought we to incite one another to fresh exertions, well rewarded as we have hitherto been by success in our endeavours, to make "two blades of grass to grow where only one grew before;" and this small mite of mine is most readily and cheerfully contributed, as a Christmas offering, with a sincere desire that, at least, it may be found of some little value, to that humble, but worthy and most useful class of persons, in the promotion of whose interest, she so zealously, and indefatigably laboured.

JOHN NOWELL.

*Farnley Wood, near Huddersfield, }
Yorkshire, Christmas, 1845. }*

"A paternal field, with a kindly soil and diligent cultivation, is the best inheritance for those that are wisely content with the simple plenty that contented their fathers; who wanting nothing that was useful, desired nothing that was vain."—*Telemachus*.

"As the produce of the earth will be in proportion to the people that till it, the increase of a quiet and peaceable multitude, will be a more valuable acquisition, than a new conquest."—*Fenelon*.

"And which is best, a superb city abounding with marble, and silver, and gold, with a sterile and neglected country; or a country in a state of high cultivation, and fruitful as a garden, with a city where decency has taken the place of pomp."—*Telemachus*.

EXPLANATION OF CHEMICAL TERMS.

"That it should be possible so to modify and intermingle a few simple substances, and thence produce all the variety of form, colour, odour, &c. which is observable in the different families of vegetables, is a phenomenon too astonishing for our comprehension."—*Parkes*.

"It was said of old, that the creator *weighed* the dust, and measured the water. The first quantity is here still; and though man can gather and scatter, move, mix, and unmix, yet he cannot destroy: the putrefaction of one thing is a preparation for the being, and the bloom, and the beauty of another. Something gathers up all fragments, and nothing is lost."—*Robinson*.

SIMPLE ELEMENTARY SUBSTANCES OUT OF WHICH VEGETABLES ARE PRINCIPALLY FORMED.

OXYGEN—An element which combines almost universally with other bodies, "composing the greatest part of water, and part of atmospheric air," and of animal and vegetable substances in general. In its expanded or æreform state it is called oxygen gas—*vital air*—*empyreæal air*; but this gas, like Hydrogen and Nitrogen gasses, has not, by pressure or other agencies, been made to assume the solid, or liquid state.

HYDROGEN—One of the simple elementary bodies which enters into the composition of vegetable and animal substances, and forms the basis of ammonia, and part of water; expanded by heat into permanent vapour or gas, it is known by the name of *inflammable air*—*Hydrogen gas*—and, being the lightest gaseous body known, is used for inflating balloons.

NITROGEN—"That moving agent which, acting under the living principle of the plant, moulds into shape the other elements." In its expanded or gaseous form it constitutes, by measure, about 80 per cent. of atmospheric air, and enters into the composition of ammonia. It is essential to the formation of the grain of plants, and the flesh of animals; and is contained, in abundance, in manures of animal origin.

CHLORINE—An element mostly found in the gaseous, or expanded state, which, by great cold and pressure, may be condensed into a greenish liquid. Gaseous Chlorine is readily absorbed by water, thus forming the *bleaching liquid* of commerce. Solid Chlorine is contained in common salt, and forms a part of most plants.

CARBON—*Pure Charcoal*—in its chrysaline state, the *Diamond*—"vegetable bone"—enters largely into the construction of vegetables and animals—and is restored to the earth or the atmosphere in their decay. The great supply of carbon to vegetation, is derived from animal respiration, combustion, or putrefaction.

SULPHUR—*Pure Brimstone*—found native, and, combined with other bodies, in animal and vegetable substances.

PHOSPHOROUS—A peculiar substance of a highly inflammable nature, in external appearance, resembling wax. It is found, combined with other bodies, in the bones and brain of animals, and in the farinaceous parts of vegetables.

COMPOUND BODIES FROM WHICH PLANTS PROCURE THE VOLATILIZABLE, OR COMBUSTIBLE PART OF THEIR FOOD.

WATER—A compound of two principal elements, Oxygen and Hydrogen.—9lbs. of water consist of 8lbs. of Oxygen, and 1lb. of Hydrogen.

AMMONIA—*Volatile alkali*—*Hartshorn*. A colourless, invisible vapour, or gaseous material, possessing a pungent, urinous odour.—All animal, and many vegetable substances, during putrefaction, emit ammonia, which, being a substance of great levity, rises into, and becomes diffused through, the atmosphere, from whence it is brought down by falling rain to the earth. It is the great medium for the conveyance of Nitrogen to plants. Water absorbs 670 times its own bulk of this gas, which, "by the united operation of cold and great pressure, may be condensed into a liquid."—17lbs. of Ammonia (solid) consist of 14lbs. of Nitrogen, and 3lbs. of Hydrogen.

CARBONIC ACID—*Chalk damp*—*Fixed air*, so called in its expanded or gaseous state, is an invisible vapour or air. It is plentifully thrown into the atmosphere by the process of animal respiration, and emitted during combustion, and animal and vegetable putrefaction. From thence it is absorbed directly through the leaves, or indirectly through the roots, and is the chief medium from whence plants supply themselves with carbon. By submitting it to great pressure and cold, it may be condensed into the liquid, or solid form.—22lbs. of Carbonic acid (solid) consist of 16lbs. Oxygen, and 6lbs. of Carbon.

UREA—An animal substance, composed of four simple bodies, which is abundantly contained in urine, and gives to that fluid its great value as a manure—30lbs of Urea consist of 8lbs. of Oxygen, 2lbs. of Hydrogen, 14lbs. of Nitrogen, and 6lbs. of Carbon.

COMPOUND AND FIXED CONSTITUENTS WHICH ENTER INTO THE STRUCTURE OF MOST PLANTS.

"Just as the few ounces of nails or glue are as necessary to the joiner in making a box, as the many pounds of wood that the box contains; so, the minute quantities of fixed ingredients contained in plants are as really necessary to their growth."

POTASH—*Vegetable alkali*—procured from the ashes of burnt wood.—57lbs. of caustic Potash consist of 8lbs. of Oxygen, 40lbs. of a curious metal called Potassium, and 9lbs. of water.

SODA—*Mineral alkali*—procured from the ashes of *marine* plants,

and from common salt—41lbs. of pure caustic soda consist of 8lbs. of Oxygen, 24lbs. of the metal Sodium, and 9lbs. of Water.

LIME—An earth well known.—28lbs. of pure Lime consist of 8lbs. of Oxygen, and 20lbs. of the metal Calcium.

MAGNESIA—An earth found in Magnesian, or in Knottingley, or Brotherton Limestone.—20lbs. of Magnesia consist of 8lbs. of Oxygen, and 12lbs. of the metal called Magnesium.

SILICA—“*Pure flint earth*”—prevails in sandy soils—is the basis of sandstone, glass, &c.—16lbs. of Silica consist of 8lbs. of Oxygen, and 8lbs. of a metal termed Silicum.

ALUMINA—“*Pure clay*”—abounds in stiff soils.—18lbs. of Alumina consist of 8lbs. of Oxygen, and 10lbs. of a metal called Aluminium.

OXIDE OF IRON—“*Rust of Iron.*”—36lbs. of Oxide of Iron consist of 8lbs. of Oxygen, and 28lbs. of Iron.

OXIDE OF MANGANESE—A substance found in the ashes of some burnt vegetables.—36lbs. of Oxide of Manganese consist of 8lbs. of Oxygen, and 28lbs. of a metal named Manganese.

SULPHURIC ACID—*Oil of Vitriol*—40lbs. of Sulphuric acid consist of 24lbs. of Oxygen, and 16lbs. of Sulphur.

PHOSPHORIC ACID—*Bone acid*—found in vegetables, and the bones and brain of animals.—28lbs. of Phosphoric acid consist of 16lbs. of Oxygen, and 12lbs. of Phosphorus.

SUBSTANCES CONTAINING BOTH THE VOLATILIZABLE AND FIXED
CONSTITUENTS OF WHICH PLANTS ARE FORMED.

CHLORIDE OF SODIUM—*Common Salt*.—60lbs. of Chloride of Sodium consist of 36lbs. of Chlorine, and 24lbs. of Sodium.

SULPHATE OF LIME—*Gypsum—Plaster of Paris*.—86lbs. of Sulphate of Lime consist of 40lbs. of Sulphuric acid, 28lbs. of Lime, and 18lbs. of Water.

SULPHATE OF SODA—*Glauber's Salt*.—162lbs. of Sulphate of Soda consist of 40lbs. of Sulphuric acid, 32lbs. of Soda, and 90lbs. of Water.

SULPHATE OF AMMONIA—*Gas Salt*.—66lbs. of Sulphate of Ammonia consist of 40lbs. of Sulphuric acid, 17lbs. of Ammonia, and 9lbs. of Water.

NITRATE OF POTASH—*Saltpetre*.—102lbs. of Nitrate of Potash consist of 14lbs. of Nitrogen, 40lbs. of Oxygen, and 48lbs. of Potash.

NITRATE OF SODA—*Cubic petre*.—86lbs. of Nitrate of Soda consist of 14lbs. of Nitrogen, 40lbs. of Oxygen, and 32lbs. of Soda.

PHOSPHATE OF LIME—“*Bone earth.*”—56lbs. of Phosphate of Lime consist of 28lbs. of Phosphoric acid, and 28lbs. of Lime.

QUANTITY OF NITROGEN,

THE GRAIN PERFECTING AND FLESH FORMING AGENT,
CONTAINED

*In one Ton of each of the following
manures, according to Hayward's
calculation.*

	Nitrogen.
	lbs. oz.
Farm yard manure ..contains	11 0
Night soil.....	39 8
Fresh bones.....	120 0
Rape dust.....	70 0
Dry blood	368 0
Guano	182 8
Shoddy.....	270 0
Sulphate of Ammonia	470 0
Soot	41 6
Nitrate of Potash	299 0
Nitrate of Soda	364 0
Urine, $\frac{1}{2}$ 100 gallons	15 8
Gas Liquor, do.	18 0

*In about one acre of each of the follow-
ing crops, according to M. Boussin-
gault's Analysis.*

	Nitrogen.
	lbs. oz.
Wheat (grain & straw) contains	88 14
Oats do.	65 5
Barley do.	56 5
Rye do.	59 10
Beans (grain)	122 2
Peas do	90 10
Potatoes (roots).....	342 14
White Turnips (roots).....	85 0
Beets (roots)*	900 0
Red Clover (green)	320 0
Lucerne do.	60 0

* This enormous quantity of nitrogen must be partly extracted from the atmosphere, not wholly from manure.

NUTRITIVE POWER OF VARIOUS SUBSTANCES, DEDUCED FROM
EXPERIMENT.

	lbs.	s. d.		lbs.	s. d.
Good Meadow Hay..	100 worth	3 8	Turnips	500 worth	4 6
Good Clover Hay....	90 "	3 3	Cabbage	250 "	3 0
Green Clover.....	474 "	5 8	Peas and Beans.....	40 "	3 0
Wheat Straw	450 "	10 8	Wheat	40 "	4 0
Barley Straw	300 "	3 7	Barley.....	55 "	5 0
Oat Straw	300 "	6 3	Oats	57½ "	3 9
Pea Straw	125 "	1 6	Indian Corn	55 "	4 7
New Potatoes	200 "	5 0	Vetch Hay.....	40 "	1 2
Old Potatoes ..	400 "	10 0	Oil Cake	33 "	2 4
Carrots	275 "	6 0			

Examples—Thus, clover, 90lbs., costing 3s. 3d., is equal in sustaining power, used as cattle food, to 100lbs. of hay, which costs 3s. 8d. Again, oil cake, 30lbs. worth 2s. 4d., is equal to 100lbs. of hay, worth 3s. 8d., and so on.

A Manual of Field-Gardening.

The Author of Nature has manifested his great goodness in assigning to us the faculty of reason, that we, making proper use of it, may receive the benefit of knowledge, and be led to admire, as we contemplate, the works of his wisdom and power. In agriculture, which is one great and continual experiment, to use that faculty is demanded of us more particularly than in any other of the arts of life; for upon it entirely depends our existence. I have, therefore, in making annotations to this little diary, desired to lead my reader imperceptibly to use that reason which God has given him—to promote an enquiry into natural causes—and to allure him into a more rational practice of this delightful art. If I have not been able to write in language devoid of scientific terms, or without using theoretical explanations, it has arisen from the difficulty of dispensing with them.

No power of words,
No grateful periods of harmonious speech
Dwell on my lips; the only art I boast
Is honest truth, unpolished, unadorned;—
Truth that may bring conviction to the mind.—*Zenobia.*

INTRODUCTORY NOTES,

PROVING THAT ALL THE ELEMENTS, REQUIRED AS FOOD BY VEGETABLES, ARE CONTAINED IN MANURES OF ANIMAL ORIGIN;
AND SHEWING THE GREAT IMPORTANCE OF THEIR
PROPER COLLECTION AND APPLICATION, &c.

THEORY OF VEGETATION.

“And therefore it was said, not elegantly alone, but philosophically; *Homo est planta inversa*; Man is like a plant turned upwards.”—*Bacon.*

Analogy between Plants and Animals.—In animals the food is received into an internal sack or stomach, it is there acted upon by certain juices, and converted into a semi-fluid mass called *chyme*. From thence it passes into the intestines, is absorbed from the grosser food by the *lacteals*, is in them refined, and goes into the veins from thence as *chyle*, and is intimately mixed with the blood. After passing through the lungs, and becoming *decarbonated*, it is then changed into *blood*, which contains materials for the nourishment of all parts of the system. In different parts of the body are certain *glands*, as the *liver* and the *kidneys*, which may be compared to pipes and strainers. They separate certain substances from the blood, which are carried off as being no longer necessary to nutrition. These, as well as the superfluous portions of food not necessary to the formation of *chyle*, are discharged as excrements.

In structure, plants differ from animals, principally in containing no *internal sack or stomach*; in plants this organ may be considered

as external; it is in the earth that the elaboration of their food takes place. Hence we may compare it to the stomach of animals, while the *roots* of plants are analogous to the *lacteals* in animals; for through those roots the liquid or gaseous food of plants is admitted to the system, after having been extracted from their grosser food in its raw state, or manure, when digesting in the ground. The *sap* of the one we may compare to the *blood* of the other. The *leaves* to the *lungs*, for in both a peculiar modification of what was originally their food takes place, one part of it being retained, the other expelled.

THE VEGETABLE AND ANIMAL COMPARED,

By M. M. Dumas and Cahours.

THE VEGETABLE.	THE ANIMAL.
<i>Produces</i> —Neutral nitrogenous matters.	<i>Consumes</i> —Neutral nitrogenous matters.
Fatty matters.	Fatty matters.
Sugars, feculas, gums.	Sugars, feculas, gums.
<i>Decomposes</i> —Carbonic acid.	<i>Produces</i> —Carbonic acid.
Water.	Water.
Ammoniacal salts.	Ammoniacal salts.
<i>Disengages</i> —Oxygen.	<i>Consumes</i> —Oxygen.
<i>Absorbs</i> —Heat.	<i>Produces</i> —Heat.
Electricity.	Electricity.
Is an apparatus of reduction, or deoxidation.	Is an apparatus of oxidation.
Is immoveable.	Is locomotive.

"Now it is certain that all putrefaction, being a dissolution of the first Forme is a meere confusion and unformed mixture of the part."—*Bacon's Sylva Sylvarum.*

The Vegetable prepares food for the Animal.—The manure which we apply to the soil, whether it may be of vegetable or animal origin, ferments, putrifies, and becomes gradually decomposed, and resolved into certain compound bodies, such as carbonic acid gas, ammonia, carbonate of ammonia, &c. These, with water, are the great sources of the food of plants. Moreover, rain as it falls from the atmosphere, brings down, in solution, a further supply of carbonate of ammonia, and other substances, which have emanated from decaying animal matter, or from grave yards, and become accumulated there.

The atmosphere, being an universal receptacle, contains, with other exhalations, a continual supply of carbonic acid gas which has been expired from the lungs of animals, or derived from other *sources*. All of which enter plants in a gaseous or liquid state, *are decomposed by them*, and resolved into the ultimate elements of

which they are composed. For there is in every plant an energy, a *power*, a *decomposing*, as well as a *combining power* superior to that of the most energetic galvanic machine.

From compounds so various, with the aid of heat, light, and electricity, plants can separate the simple elementary bodies *carbon* or charcoal, *oxygen*, *hydrogen*, *nitrogen*, &c., and at the same time appropriate them as food, for these peculiar elements they principally subsist upon. That very carbonic acid gas, which was once expelled from the lungs of animals, is thus decomposed into its elements *carbon* and *oxygen*, the latter is partly returned to the air we breathe; to be again respired by animals, while the former being assimilated by the plant, forms, if we may so term it, the *vegetable bone*.

The other compounds, water, ammonia, &c., become resolved by the same power, into their ultimate elements, which are afterwards assorted, combined, or bundled together and assigned each to its own place in the vegetable structure, in the most exact and beautiful manner, again to minister to the future support of animal life.

In vegetable, as in architectural masonry, various saline substances in solution are required to act as cements, to give stability to the plant, to saturate its acid juices, or for other purposes; these are potash, soda, lime, and indeed, a variety of inorganic substances, but different tribes of plants exercise a peculiar choice.

"Do the excretions of *Man* contain elements of fertilization sufficient to produce the food he consumes?"—*A Problem worth the attention of Legislators.*

The Animal prepares food for the Vegetable.—But, whatever substances enter plants as food, they are all derived from the *earth*, or the *atmosphere*, and when moulded into vegetable forms, and in afterwards becoming the food of animals, such of them as came originally from the *atmosphere*, are again restored to that medium, by animal respiration, &c. The remainder, which have not been consumed in the respiratory organs, must go to the formation of the bones, the flesh, and the animal secretions, or become expelled in their excretions. Hence, in these things the whole of the elements required by the vegetable will be contained, which taken collectively, must represent the *complement* of its structure; and when restored to the earth, be sufficient, with what the atmosphere has received, holds, and is ready to furnish, to produce the same quantity of that vegetable.

- But, the domestic animals, and their secretions, are the food of *man*; consequently, he and his excretions become the depositaries of the ingredients derivable from all the animal and vegetable food he uses, except what passes away by respiration, &c., into the atmosphere. Now if his bulk remain constant, and the bones and excretions of the animals he has fed upon have been exactly

restored to the soil, his excretions will become the *complement* of the plant, and when duly returned to that soil, furnish elements to call into action what is already gone into the atmosphere, to produce the same amount of vegetable substance that entered, directly and indirectly, into his food. And if this be so, then, the conclusion will follow,

That the collection and proper application, to the earth, of the bones, liquid and solid excretions of animals, in particular those of man, ought to be the primary object of agriculture; as in them are contained ALL the elements required to enable the same soil to produce an equal amount of the vegetable substance consumed in their production.

"There shall be no idleness in my dominions; for if there be one man idle some other man must suffer cold or hunger. My villages shall be cleaned, that the corn may grow.—Chinese Emperor."

The economising of manure, man's duty and interest.—And here we cannot fail to admire the wisdom of the design, which is doubtless intended, to lead mankind imperceptibly, as it were, into habits and practices necessary to the existence of our species. We see that in the processes of the animal economy, whereby life is sustained, there are formed, separated, and voided from the animal organism, substances endowed with qualities offensive to our senses, nauseous in proportion to their value, particularly to the sense of smell, so that we are compelled to get rid of them; and which require of man that he shall put them away, or bury them forthwith, out of his sight in our common parent, the earth. The penalty for the utter neglect of this duty would be famine, pestilential disease, and a train of human ills. Nevertheless, in these things, thought to be so utterly vile and offensive in their nature, are contained "pearls of great price," indeed above any price; which, if husbanded and duly commingled with the earth he cultivates, are the means of sustaining life by the production of his food.

Let us not say that the fungus is a choice product of the dung-hill, without remembering that our own existence depends upon elemental matter derived from that humble source. How necessary then it is, that men and nations should attend to an object of such primary importance to their existence!! How deep the obligation we are under to attend to the economising of all the manures created near our abodes as one of the first of duties!

"In the moral government of this world, it is most wisely ordered that whatever we willfully waste at present, we are sure to feel the want of in future."

The field-gardener compelled to economise his manure.—His operations being confined to a small area, seldom more than four or five acres of land, he is obliged, in a space so confined and with limited means, to practice this necessary economy. He is early taught to value his cow or pig, as not merely yielding him a certain quantity of milk, or animal food, but also as producing him the manure

absolutely necessary for his future operations. The cow, the pig, are his machines for the manufacture of manure, and if its supply be deficient, he goes not to obtain it elsewhere, but sets up a new machine for its production, in the shape of an additional cow or a pig. Hence he will husband it with the greatest care: manuring as he does every crop, necessity compels him to do so, he knows his labours without this economy would be exerted in vain. Hence also, for the most part, arises the superiority of small over large farms, in regard to their amount of produce.

"By labours like these man receives a real increase of the seed thrown into the ground, in a kind of continual miracle wrought by the hand of God in his favour, as a reward for his innocent life and virtuous industry.—*Franklin*."

Economy of manure in Flanders.—Strangers are perfectly astonished by the frequent manurings of the Flemish farmer, and are led to wonder how all the manure is obtained, until they observe more minutely the method of soiling cattle, &c. In every town and village you observe the greatest cleanliness, for their pavements and all dirty places are carefully swept with brooms, and hourly resorted to by professed scavengers as sources of profit; every particle of vegetable or animal refuse is sought out with great avidity for this purpose; and in Flanders, as in China, manure is quite an article of trade. The selling price of each description is accurately defined. Towns let the cleansing of the streets and public retiring places at great rates; and we are informed by M. CHAPTAL, "that there are in every town sworn brokers expressly for the purpose of valuing night-soil; and that these brokers know the exact degree of fermentation in that manure which suits every kind of vegetable at the different periods of its growth."

"Without manure there is no corn—without cattle there is no manure—and without green crops and roots cattle cannot be kept."—*Flemish maxim*.

Cow Lodges.—If then the collection, and application to the soil of all the manure created near our abodes is the chief point, the very foundation of good husbandry, a few practical directions derived from experience, with hints relative to affairs of such importance, may be acceptable to the reader. The commencement of the manufacture of manure is in the cattle-house, therefore let every exertion be made to have the place complete. Let the building itself stand high and dry, and if possible let the animals stand at either end of it, facing each other, with a paved road-way betwixt for the convenience of feeding them. This road-way must be a thoroughfare with spacious doorways, so that your forage cart may pass completely through the building, and as it goes along, the attendant may toss green feed on either hand to the cattle.

Feeding Troughs.—They ought to be fed out of stone, or brick-work bins, or troughs; the former may be easily formed, by placing

a double row of flag-stones on both sides of the thoroughfare and nearly across the cow-house, partly within the ground, at about thirty inches from each other, with the row nearest either side of such thoroughfare standing about a yard above the floor, and that nearest the cattle about two feet. Let the bottom and the enclosed space so formed, be paved and divided with stones at convenient distances; when, with a light rail of wood running round the top and bolted to the stones, a series of feeding troughs will be formed and held firmly together.

“Improve those homes,
Where all the creatures are your servitors.”—*Fletcher*.

Gutters, &c. within the Cow Lodge.—The cows may be ranged with the bins in front, and tied in the usual manner. They must enter at a door of ordinary size, close in each corner of the building, and pass along the group to their stalls, while at the corner opposite a small opening provided with a door must be left for the ejection of their manure. This group, as it is termed in Yorkshire, or space behind the cattle, must be at least four feet broad, most accurately paved, and the joints well cemented. The pavings ought to be laid down upon clay puddle, or well rammed earth, and must incline to a channel or gutter cut out of the solid, to a depth of two inches, in stones laid down in one continuous line, upon well rammed clay puddle, and jointed with the best cement. This line of stones must have an inclination to the manure hole, and pass under it, through the wall, so that the liquid manure may run freely from the floor, where it is received from the cattle, and afterwards be collected in, and conveyed by the gutter to the tank, placed for its reception without the building.

“The winds do sweep these chambers ev’ry day.”—*Fletcher*.

Circulation of air in the Cow Lodge, &c.—With two spacious doorways, in front, and one of common size behind, and the manure-holes, but all of them placed that no currents of cold air from without, may come in contact with the animals, we may depend on a free circulation of the atmosphere, and that the internal temperature, in summer, will be more agreeable and cooler, in general, than that without. In summer time these doorways may remain quite open during the day, and be only closed at night by open wicket gates, to prevent intruders; in winter, of course by tight doors.

“‘Tis education forms the youthful mind;
Just as the twig is bent, the tree’s inclin’d.”

Thrashing Floor and Industrial School.—A beautiful arrangement has been adopted at Willingdon school, and a similar one would

make your cow-house complete. A well boarded floor is placed above the cattle, upon which the corn is thrashed. At one end a convenient school-room is placed immediately over the cattle, the entrance is from without. The animal heat of the cattle, will thus sustain a warmth in the room, and their contiguity help to promote the health of the children. The thrashing floor being near at hand, with an outer entrance very near that of the school-room, the scholars are easily transferred, from book-work, to manual labour. If you live in an agricultural district, and among sensible neighbours, you may make use of the little hands of children in the same way, in the cultivation of your small farm, and give them the blessings of education, by three hours teaching in the morning, in return for three hours of their labour in the afternoon.

"The work, divided aptly, shorter grows.—Hor.

Convenience of a well-arranged Cow Lodge.—In feeding cattle, the attendant will find the cow-house thoroughfare most convenient. With his cart, in the summer months, he may enter at one door and pass between two rows of his cattle, serve them with green food, and deposit the remainder upon the floor for future use, passing, without turning round, through the opposite door. In winter, with his hand-barrow full of turnip mash, or boiled roots, he may, with his shovel, serve out, by throwing into the stone troughs to each cow, her allotted portion of food, placing, as occasion requires, hay or straw in the same receptacle, with the greatest ease and advantage to himself.

The Piggery and Privy.—The piggery ought to be placed at one end of the cow-house, the privy at the other, the latter furnished with an adjoining covered shed, &c., wherein night-soil composts may be formed, and with a urinal for the reception of whatever chamber-lye is made in the dwellings, or on the premises. The piggery must be furnished with a yard, reaching to the back of the cow-house, and both offices must have gutters to convey the fluids, voided in them, to the composting yard channels, and thence to the tank.

Composting Yard.—The commencement of the manufacture of manure will be within these offices or cattle lodges, the continuation of its manufacture in the composting yard, which ought to be placed on a lower level, and immediately behind the cow-house. I would enclose this important place, from the main farm yard, by a wall six feet high, of a semi-circular form, and nicely coped, reaching from the external wall of the piggery to that of the privy, and embracing a roomy space, taking up on one side, the length of the cow-house and breadths of the pig yard and privy shed. An opening must be left in the centre of it, which I would close by a rustic door, of neat homely manufacture. From this entrance, a paved



road about five or six feet broad, edged with flag-stones, and standing about three feet above the surface, may be formed up to the back door of the cow-house thoroughfare, so that a cart may pass through the yard and the cow-house without turning round.

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 "All things without, which round about we see,  
 We seek to know, and how therewith to do."—*Sir J. Davies.*

**Dung Mixens.**—Thus taking a good sweep behind the cow-house into the main yard, you will have a spacious area, divided by a roadway in the middle, and allowing on either side a roomy quadrant shaped floor, upon which to compost the manure ejected from the cow-house. It will be enclosed by a wall, acting as a breast-work to the manure heap when formed, which will prevent evaporation, and escape of liquid from its sides, by restoring what filtrates to the floor of the mixen. This yard is to be your agricultural laboratory; for truly, many chemical changes, although invisible to you, will there be effected, and a great variety of valuable products obtained for future use.

As the dung mixen, which contains these products, is a most important agent—it is a thing for you to be very proud of. You may send across the seas to the Chincha islands, or to Ichaboe, for guano, but in a dung mixen, properly compounded, you will find, to a certain extent, all the ingredients that give that excellent manure its value.

**Tank.**—But in putting down the tank, or forming the floors for these mixens, all your care will be required so that none of your fluids may be lost. The best place for the tank will be near the entrance to the composting yard, partly under one of the mixens, but also reaching under the wall into the main yard, so that its contents may be inspected from without. There let it be placed, in a pit sunk within the ground, so low, that there may be a good descent towards it from every part of the yard.

It may be formed of bricks, or what is better, of stones grooved and jointed, and placed upon a floor of well puddled clay at the bottom of the pit; after it is placed there, it must be cemented well together, and surrounded with clay puddle well beaten down at its sides, particularly at the bottom and corners. After the tank is completed, let your gutters or channelled stones be laid down to it in a direct line, across the floors of the mixens, from the cow-house, piggery, &c., with the same care as before, and then let the whole floors be filled, to the height of the channel stones, with well beaten clay puddle, at an inclination from the outer walls in all directions to them. Let these tight clay floors be paved with rough stones, so that all drainings from the mixen by falling upon them may be conveyed to the gutters, and joining the liquid in its passage from the cow-lodge or other sources, both may flow without interruption to the tank. To promote this, the



gutters, as also that part of the tank which is intended to lie under the mixen, must be covered with loose stones, to prevent the intrusion of manure from above them. Let the water from the eves of the building, and top water from every source, be led away altogether from this yard, and your manure manufactory, with the exception of placing the pump, will be completed.

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"Let every thing have its right place."—*Roscom.*

*Tank liquid Pump.*—Within, and near the doorway of, the composting yard, place down your pump, so that its working barrel being buried in the warm manure heap up to the cistern, the freezing of its contents during winter may be prevented. The lever of the pump must project over the wall, and be worked in the main yard, while its delivering pipe may be furnished with a wooden spout eight or ten feet long, connected together by a swivel joint, round which it turns horizontally—inwards—over the manure, in order that the tank liquid being pumped may flow over either mixen—or outwards, be delivered into a water barrel mounted upon wheels, standing in the main yard, from whence it becomes removed to the growing crops, or applied to other purposes.

*Size of Tank.*—In regard to the size of the tank, one of five feet in length, three feet in breadth, and three feet in depth, has been found quite sufficient for eight or ten head of cattle; it will be filled generally in about 17 days. Such a tank may be emptied, and its contents spread upon grass near the homestead in about an hour. In the West of Yorkshire, the cost of one of the above dimensions, exclusive of digging the pit, and the puddling will be about fifty shillings.

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"Necessity the mother of invention."—*English Proverb.*

*Temporary Tank.*—If a cottager, or his landlord, wishes to avoid expense, a good substitute will be found by sinking within the ground one or two oil pipes, or sugar hogsheads, connected by a tube at the bottom, and placing them upon a bed of puddled clay well beaten, having the sides well enwrapped with the same material; as the girths decay, the vessels by external pressure will remain firmly united together and last many years, especially if the inside be charred. I must beg you, however, during the fixing of these things, always to remember, and have uppermost in your mind, that a single aperture, through which a knitting needle could scarcely pass, may be the means of tapping your tank, and withdrawing part of its contents, while you remain in ignorance of its existence.

"Nature yields but the matter,—man to forme,  
Which makes the world a manifold returne."—*Lord Brooke.*

**Method of Composting Manure.**—Spread equally, and cover the whole of each mixen floor, with a layer of cow dung, horse litter, &c., to the thickness of eight or ten inches, and keep the long straw nearest the floor. Then for every cart load of fresh dung, take 10 or 12lbs. of gypsum (*plaster of Paris*) pounded from the rock, which will cost you from 2s. 6d. to 3s. per cwt., sprinkle it over the surface of the layer of dung. Bring in a load of mould from headlands, decaying roots, scouring of ditches, road scrapings, stubble, saw dust, indeed nothing can come amiss, and leaving it on the composting yard pavement, the cart may pass through the cow-lodge without turning round. Let the rubbish, so left, be handed to either mixen, and spread over the surface; moreover, when you can, at intervals, obtain a load or two of earthy matter, you may spread it upon the other. In this state let it remain as a covering, until you have a fresh supply of dung under the manure doors, then fork over the first stratum, mixing the dung and mould or rubbish well together, and proceed just as before, careful neither to omit the gypsum, nor mould, in forming a second one.

Previous to forming another, repeat the forking over of the previous layer, and after a few repetitions, pump and diffuse over the whole surface as much tank liquid as will completely saturate the manure heap, and any excess will fall back again into the tank; and this repeat, from time to time, when it may be deemed necessary to do so. With many animals in the byres, and much space in the yard, you may thus create an enormous bulk of manure, rich, and uniformly mixed.

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"Thus do these elements become his servants and his treasure."—*Lord Brooke.*

**Removing.**—When properly decomposed, remove it, by bringing your empty cart through the cow-lodge thoroughfare, slice off the sides of the mixen nearest the path-way, use a plank and barrow for that in the remote parts of the yard, and pass through the entrance door of the composting yard, with the laden cart, away into the fields.

**Further means of enriching the Mixen.**—Your pigs must be continually supplied with fresh mould; which they will tread into the richest compost; it may then be handed over to, and compounded into the mixen. The night-soil compost, hereafter described, may be also used in the same manner.

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"The surest way to obtain the assistance of others, is to shew a disposition to assist ourselves."

**Partial Improvements.**—As it may happen, however, that the arrangements within your cow-house are already formed, or that

you do not keep sufficient cattle, or from other causes, you may not be induced to undertake all the improvements which I have been thus minute in describing, still, I trust your landlord may assist, and encourage the introduction of as many of them as possible, and that all your thoughts may be intent upon making your cow-house in every way complete for your own convenience, and to the promotion of the health of the animals. There is one thing in particular to which it is no less your interest than your duty to attend—the collection of all the liquid and solid manure voided there; for your chief object in bringing green food to cattle in the stalls, instead of taking them out to pasture in the fields upon that green food, will be the more perfect economising of their manure.

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#### PROPER METHOD OF COLLECTING HUMAN MANURE.

"Perhaps you are not aware that in Holland, its annual value per head of every individual, is estimated at THIRTY-SEVEN SHILLINGS AND SIXPENCE."—*Dr. Buckland.*

Neither may the cottager be aware that the value of the liquid and solid excrements, voided by a small family, if properly collected, compounded, and dried, will be equal to the rent of a good cottage.

**Portable Pails.**—A very ingenious method is followed by the Eastbourne field-gardeners, in order to collect all the excrementitious matter voided in the privies:—An ale cask with one end removed, large butter firkin, or tub, value about 2s. 6d., is provided: a few inches below its top, two strong iron ears or handles, are firmly rivetted, for the convenience of removing it. Two of these tubs are usually placed under the privy seats, and when nearly filled, are easily removed to the composting shed by two persons each taking hold of a handle. They are then turned upside down, and the contents received upon mould, and immediately composted with more mould, ashes, or other refuse, using 8 or 10lbs. of gypsum, (plaster of Paris) for each pail full of materials. This mixture may be further enriched by the addition of tank liquid, beating all well together to the consistency of mason's lime; when spread upon the floor of the shed it will soon dry spontaneously, and be found a most valuable top-dressing for every kind of crop, upon which it may be sown by hand, for all offensive smell is speedily removed by the action of the gypsum, and the retentive quality of the mould, or ashes.

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"The annual loss in England, in liquid manure alone, has been estimated at Seven Millions sterling!"

**Purification of Cities.**—Were this simple method adopted in town and country, then might we expect to see British agriculture soon flourish in full perfection. Liquid excrementitious matter has become an article of trade in manufacturing districts; why should not solid become the same? Near every town undoubtedly there



ought to be a regular Domestic Guano manufactory carried on, or contributed to, by the public scavengers; and surely, ere long, the collection of agents so important will claim the attention of men of capital and enterprise. Tubs with tight fitting lids and deep rims might be used for this purpose, to collect the soil in privies, be replaced, when filled, by others, and borne, in covered well contrived vans, to the suburbs of our cities; where, in open composting sheds, the domestic guano, or other mixtures hereafter described, might be fabricated. The ashes from coal fires, at the same time, might be separately tubbed, borne away, and afterwards used to compound with, and assist in their desiccation. The agency of steam, also, could well be applied to dry such compounds, and of mechanical arrangements for beating up the ingredients. By such means all offensive smell in privies would be unknown, and the removal of their contents not be offensive. While the elaboration of them would be found far less unpleasant than can be imagined; of this the writer is fully convinced, from a close observation of the feelings of farm servants in its performance.

In order that we may appreciate these neglected things at their true value, let us attend to the following important observations of an eminent philosopher. "If we admit" says he, "the liquid and solid excrements of man amounts on an average to  $1\frac{1}{2}$  lbs. daily, ( $1\frac{1}{4}$  lb urine, and  $\frac{1}{4}$  lb. of feces) and that both taken together contain 3 per cent of nitrogen, then in one year they amount to 547 lbs., which contain 16.41 lbs. of nitrogen, a quantity sufficient to yield the nitrogen of 800 lbs. of wheat, rye, oats, or of 900 lbs. of barley. —*Boussingault.*

And again, "Why" says Dr. BUCKLAND, "should we go so far as the shores of Africa when we have the remedy within ourselves —the essence of ale and beer, and the quintessence of beef and bread and cheese? These are the best of all possible manures, and why? Because they restore to the land that which the corn and the ox have taken away; because they restore things which the atmosphere cannot restore; that element can furnish charcoal and ammonia" to growing plants, "but not that nutritious phosphate of beef, nor the gluten which enters into the commodities of which beer is composed."

*End of the Introductory Notes.*

# A DIARY OF FIELD-GARDEN OPERATIONS, In Sussex and Yorkshire, DURING 1843-4.

"Let not ambition mock their humble toils, their homely joys and destiny obscure,  
Nor grandeur hear with a disdainful smile, the short but simple annals of the poor."  
GRAY.

THE Diary which follows is chiefly a record of the daily operations upon four small Garden-Farms, lying several miles distant from each other, near Eastbourne, in Sussex. It may be depended upon as containing a correct report of the methods of cultivation adopted by numerous garden farmers on the estates of Mrs. DAVIES GILBERT. The farms alluded to, selected as models, were,

1st. That of the *Willington School*, conducted by G. Cruttenden, who occupies, in addition to the school-house, five acres of land at the usual farmer's rent. He is assisted by from five to twenty little boys, who, paying each one penny per week, receive instruction in reading, writing, and arithmetic, from nine till twelve in the morning, and in the afternoon help him in return with his farm labours and stall-feeding, from three till six o'clock. This place, adjoining the village of Willington, is delightfully situate, on one of the slopes declining from the Chalk Downs. It is in view of the English Channel which, with the Martello towers along the coast as far as the eye can reach, form a striking scene. The place exhibits neatness and order without the least display.

2nd. That of the *Eastdean School*, near Beachy Head, conducted by John Harris, who holds five acres of land in addition to the school, where about the same number of boys are trained to mental and agricultural pursuits.

3rd. That of *Jesse Piper*, which is a private farm, higher up the Down than the school at Eastdean, of four acres, he is partly employed as an overlooker with other work, but cultivates his plot two or three days per week, assisted by a boy, and man occasionally. He was lately examined by the committee of the House of Commons on the Allotment question.

4th. That of *John Dumbrell*, at and near Jevington: this is also a private farm of six acres, he is assisted in its cultivation by his father, seventy years of age, in addition to which he keeps a little village shop; he also was examined before the same committee. Jevington is situate about four miles from Beachy Head, and is sequestered deep in a vale amongst the chalk hills. In general the soil of these farms is formed from the disintegration of the chalk rock which is close below the surface, or of alluvial mould swept into the vallies; the colour of it is whiter than is quite agreeable to the eye, and evidently must owe much of its fertility to the labours of man, or the mildness of the climate. Such of these places as the author had an opportunity of viewing, during a late visit appeared to be pictures of comfort and contentment.

## July.

*Week commencing Monday, July the 24th, 1843.*

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### Sussex.

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"The seeds of every virtue here below,  
From discipline and early culture grow."

**MONDAY**—*Willingdon School*. 16 boys digging and applying liquid manure for white turnips, after spring tares. *Piper*. Doing the same. *Dumbrell*. Sowing turnips and hoeing potatoes.

**TUESDAY**—*Willingdon School*. Boys employed the same as yesterday. *Piper*. The same as yesterday. *Dumbrell*. Hoeing turnips and potatoes.

**WEDNESDAY**—*Willingdon School*. Boys employed as on Monday. *Piper*. Hoeing turnips, and mending the lucerne with liquid manure.\* *Dumbrell*. Hoeing turnips, thinning mangel wurzel, and mixing dung and mould.

**THURSDAY**—*Willingdon School*. Boys employed as on Monday. *Piper*. Hoeing his 30 rods of swedes, sown about the middle of May.† *Dumbrell*. Hoeing turnips and digging up tare ground.

**FRIDAY**—*Willingdon School*. Boys dressing the ground, and sowing white turnips. *Piper*. Digging where the underground-onions came off, and sowing white Norfolk turnip seed.‡ *Dumbrell*. Hoeing turnips§ and carrots, digging up tare ground and sowing turnip seed.

**SATURDAY**—*Willingdon School*. Boys earthing up potatoes after rye, *Piper*. Digging the ground where the turnip seed was raised, and mending a rod of lucerne. *Dumbrell*. Thinning and hoeing carrots.

### COW-FEEDING.

During this week one of *Dumbrell's* cows grazed during the day and was fed in the stall at morn and even with 40lbs of Italian rye grass; his other cow and heifer, altogether stall-fed, with 137lbs. of tares, and 27lbs. of Italian rye-grass.

*Piper* has fed his cows with tares and lucerne, *cut, as it always ought to be, a day before it is given to them.*

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\* About twenty gallons to the rod is usually applied to lucerne, which ought to be put on as soon as the grass is cut, and which never ought to be close cut; by so doing they generally mow four times in the summer.

† The rod mentioned in the text is 16½ feet square, or 30½ square yards, a boy twelve years old will dig half a rod during his three hours of afternoon's labour, worth threepence to the schoolmaster.

‡ A quarter of a pint of white Norfolk turnip seed is allowed for 10 rods.

§ The hoe is generally nine inches wide, and the plants are left fifteen inches apart; it is always best to hoe turnips three times over and then single them by the hand.

## STALL-FEEDING OF CATTLE.

"The first object of good husbandry, is to economise and make a proper application of manure—The second—To economise and make a proper application of farm produce."

*Advantages of Soiling Cattle.*—Sir JOHN SINCLAIR states them to be seven:—

1. *Saving of Land.* As reported to the Board of Agriculture, thirty-three head of cattle were fed, from the 20th of May to the 1st of October, 1815, on  $17\frac{1}{2}$  statute acres, when it would have required 50 acres to have pastured them.

2. *Saving of Fences.*

3. *Saving of Food.*

4. *Improvement within doors.*

5. *The greater product in milk.*

6. *Increasing the quantity and improving the quality of manure.*

7. *Obtaining a higher value for the produce of the soil.*

To which the Rev. W. THORPE adds, "*The making as much manure in the summer months as in the winter.*" Mr. HOWARD, the worthy secretary to the Yorkshire Agricultural Society, has practised this upon a large scale for a number of years. A field of 14 acres is divided by him into seven parts, and sown with barley, red clover, mangel wurzel, winter tares, swedish turnips, spring tares, and turnips: affording seven acres of winter food, and seven acres of summer food for the cattle in the farm yard. He says,—“There is no doubt that one acre of these turnips, carted green to the farm yard, and given to horses and cattle in a cool stable, will go further than four acres of the best grass land; and by the practice of soiling, an arable farm may be made to support as much stock as a grazing one.”—*Farming at Scoreby*, p. 26.

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“—————Here let the swain retreat,  
His flock before him, stepping to the fold,  
—————and there, remain  
All the hot noon, 'til cooler hours arise.”—*Thomson*.  
And avoid the pestilential damps of night.

*English Prejudices against Cattle Soiling.*—Whether English prejudices may ever allow the soiling of cattle entirely within doors to be carried into effect, may admit of question; one thing, however, admits of no question whatever, that not a single argument, of any weight, can be brought forwards in favour of their remaining in the green pastures, exposed to the attacks of insects at noon-day, or the vicissitudes of weather during the night. The argument must be in favour of stall-feeding, at any rate, for two-thirds of every twenty-four hours during the summer months; and the wishes of the animals will soon be manifested if you afford them the opportunity. They naturally desire to betake themselves, for several hours at noon-tide, to the stalls, and would rather come to the

## July.

*Week commencing Monday, July 31st, 1843.*

### Sussex.

**MONDAY**—*Willingdon School*. Boys digging and manuring for white turnips after tares. *Piper*. Reaping rye. Mem.—When the rye is removed, the stubble is digged up, mended with liquid, and turnips sown, or cabbages planted. *Dumbrell*. Hoeing turnips, mixing dung and mould together.

**TUESDAY**—*Willingdon School*. Boys doing the same as yesterday. *Piper*. The same as yesterday, and mixing dung, &c. *Dumbrell*. Digging up tare ground; the heifer drew one load of manure nearly a mile, up hill and down.

**WEDNESDAY**—*Willingdon School*. Boys doing the same as before. *Piper*. Mixing dung and mould together. *Dumbrell*. Digging up tare ground.

**THURSDAY**—*Willingdon School*. Boys dressing the ground and sowing white turnips after tares. *Piper*. Mending the lucerne with liquid manure,\* and hoeing turnips. *Dumbrell*. Digging up tare stubble, and sowing rape seed.

**FRIDAY**—*Willingdon School*. Boys hoeing swede turnips. *Piper*. Hoeing carrots. *Dumbrell*. Weeding tares.

**SATURDAY**—*Willingdon School*. Boys hoeing swede turnips. *Piper*. Hoeing carrots. *Dumbrell*. Mending the cow-lodge.

### COW-FEEDING.

*Willingdon School*. The cows have been eating during the week the second cut of clover.

*Dumbrell*. One of his cows grazed during the day, and was fed, morn and even, in the stall with Italian rye-grass; one cow and heifer stall-fed upon tares and Italian rye-grass, as before, till Wednesday, since then, both cows were fed on Italian rye-grass, and the heifer upon tares alone.

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\* Before the commencement of harvest, the crops not requiring much attention, will be the proper time for placing down a tank. *Piper's* tank for his five acres farm, holds about 150 gallons, it collects from the cow-house and piggery all the liquids voided there; sometimes he increases the strength by adding one bushel of soot, a quarter of a bushel of common salt, 6lbs. of soda, and five or six gallons of the contents of the portable pails before mentioned.

*Observation*.—The addition of the soda, if in even a partially caustic state, is, however, objectionable, as it will decompose the ammonical salts contained in the soot and excrementations matters, while the ammonia will be expelled, and, from its volatility, fly away. The addition of 8 or 10lbs. of gypsum would be decidedly better, and be a means of retaining this fertilizing agent.

### STALL-FEEDING: SOILING IN THE FIELD: MR. BLACKER'S PLAN.

milking pail within doors in the evening, and remain there all night, than that it should come to them in the meadows. So that, with all our prejudices, we may rest assured that two-thirds of their manure ought to be saved, by stall-feeding, even on the ground of its being more beneficial to the cattle, and more consonant to their feelings. And if it should be contended, that by their ranging over the pastures, the soil still receives all the manure voided by the cattle, I answer, that truly it does so, but a thousand times greater in quantity, in most places, than the plants upon which it falls require, and that the rejected portions of it, particularly the fluid parts, soon descend out of the reach of vegetation, and moreover, that plants, like animals, may be fed to repletion; a certain definite quantity of food they require, and must have, but more than that quantity, a quantity most accurately defined, they cannot receive into their system without injury.

*Soiling in the Field.*—Should a prejudice exist against the soiling of cattle entirely within the house, a variation of the plan may be adopted, and perhaps to some advantage where the green food lies far from the homestead. Let them be taken to the field, in summer time, during the day, and be housed at night. They may range over the space where the crop has been gathered, being separated from the green food, by wooden hurdles, which may be tossed over to them, and a removal of the hurdles take place as the cutting of the crop proceeds. At the same time the digging, or ploughing of the stubble, for a stolen, or other crop, may be going on, and the attention of the men directed to the cattle; thus will the intimate incorporation of their manure with the soil be effected without delay. A moveable shed, covered with M'Neill's patent felt-cloth may also, with a little ingenuity, be formed, for the cattle to take shelter under during showery weather.

Through the kindness of WM. HOWLY, Esq., of Castle Connell, I am allowed to extract what follows from his very interesting *Agricultural Chart*, published with the benevolent design of improving the condition of the small farmers in Ireland, with which he has favoured me.

#### MR. BLACKER'S PLAN

*Of supporting Three Cows throughout the year on two Imperial acres of land.*

"One English acre, sown with clover and rye-grass, will house-feed three cows, from the middle of May, till the middle of October, and if the land lie in good heart, and has a rood of vetches to assist it, part of the first cutting may be made into hay. The vetches ought to be sown early, and, as they are cut, the ground should be

## August.

*Week commencing Monday, August the 7th, 1843.*

### Sussex.

**MONDAY—Willingdon School.** Boys were reaping wheat. *Piper.* Digging the ground where the rye came up, and mending a rod of lucerne with liquid. *Dumbrell.* Digging up tare ground and sowing turnips on the same.

**TUESDAY—Willingdon School.** Boys reaping wheat. *Piper.* Sowing white turnips on the ground where the tares came off. Mem. They ought to be left thicker than swedes, and thus you may be able to gather them a fortnight sooner. *Dumbrell.* Hoeing carrots, turnips, reaping peas, and mixing dung and mould.

**WEDNESDAY—Willingdon School.** Boys reaping wheat.\* *Piper.* Cleaning mangel wurzel and carrots, and carrying mould to the dung mixen. *Dumbrell.* Reaping peas, hoeing turnips and putting on 100 gallons of liquid to four rods or 121 square yards of Italian rye-grass after mowing.

**THURSDAY—Willingdon School.** Boys reaping a quarter of an acre of peas. *Piper.* Reaping wheat. *Dumbrell.* Digging up the ground and mending the pig pound.

**FRIDAY—Willingdon School.** Boys hoeing swede turnips, sown after mangel wurzel had failed. *Piper.* Reaping wheat and mending a rod of lucerne with liquid. *Dumbrell.* Digging up tare ground, mending pig pound, and sowing cabbage seed.

**SATURDAY—Willingdon School.** Boys hoeing swede turnips. *Piper.* Reaping wheat. *Dumbrell.* Hoeing turnips and reaping wheat.

#### COW-FEEDING.

*Willingdon School.* The cows were eating the second cut of clover *Dumbrell.* One cow grazed in the day, and stall-fed with Italian rye-grass till Wednesday, the remainder of the week with tares. Another, Monday on 100lbs. Italian rye-grass, Tuesday on 100lbs lucerne, for the two following days and Saturday on 100lbs. tares and cabbage on Friday. The heifer 64lbs. of tares each day with a few cabbages on Friday.

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\* *Late sown Turnips.*—When the harvest is thus early, you may dig up a quart of an acre of wheat stubble, and sow with white turnip seed, as soon as possible. Turnips will be found very handy about the following March, when you may begin to pull them for cows, a month sooner than rye or tares will be ready.

#### CABBAGE SEED BED.

Prepare a 'bed four feet broad in a sheltered part of the field, which manure moderately—Sow *Scotch* or *early hope* cabbage seed in drills four inches apart, and rather thin, the plants to be put out in the following February and March, they will be fit for use in September, October, and November.

### STALL-FEEDING: MR. KELLY'S EXPERIMENT.

planted with rape, taken from a nursery bed, sown in the first week in June; or, if the vetches be cut the last week of that month, the rape seed may be sown, ridge by ridge, as they are cut; in either case, if the land has been manured, the crop of rape will be ready for use by the time the frost has stripped the leaves off the clover, and will be found sufficient to feed the three cows until the middle or end of November. The turnips will now be ripe, three roods of which will be an over supply for that stock, till the middle of April, aided by the hay which has been made; at which time the rape will be again fit for cutting, and will supply food till the succeeding crop of clover and rye-grass is again fit for the scythe, when the same system of feeding commences. The clover in January, and when cut ought to have a good top-dressing."

#### MR. KELLY'S EXPERIMENT.

*Eight Cows fed throughout the year on two Irish acres of land.*

"Having half an acre of clover sown the previous summer on part of the two acres, the other three half acres (being in stubble) I immediately ploughed, and in the last week in September sowed half an acre of winter vetches. In the last week of January I sowed another half acre of spring vetches. The other half acre I prepared so as to completely pulverize the soil, by ploughing, &c., and from the 20th to the 26th sowed it with mangel wurzel. The vetches sown in September, were fit for cutting in the middle of April, and were soiled off about the 20th of May, when I immediately planted the ground with cup-potatoes, giving it a good coat of fresh manure. The vetches sown in January were fit for cutting by the 15th of June, and were soiled off the 13th of July—this half acre I prepared and manured for Norfolk turnips, which were sown in drills on the 22nd. These turnips, as well as the half acre of potatoes, being sold, 18 tons of hay were purchased with the amount, without which the soiling could not have been carried on.

"*The Eight Cows were fed as follows.* From the 19th of April to the 17th of May—on winter vetches giving six feeds per day to each cow, with 2lbs. of hay between each feed, and 4lbs. at night. From the 17th of May to the 14th of June—on the first cutting of clover, regulating the feed as with the vetches. From the 14th of June to the 13th of July—on spring vetches, regulating the feed as above. From the 13th of July to the 14th of August—on the second crop of clover, with some mangel wurzel thinned from the crops (one feed of mangel wurzel will be enough)—hay to be given between each feed as above. From the 14th to the 24th of August—the leaves of the mangel wurzel that were subsequently to be thinned out, with hay as before. From the 24th of August to the 20th of September—a few roots of mangel wurzel, of those that the leaves were taken from, and the third crop of clover with hay, four feeds of



## August.

*Week commencing Monday, August the 14th, 1843.*

### Sussex.

**MONDAY**—*Willington School*. No report for the week, probably the little boys out with the farmers. *Piper*. Reaping wheat. *Dumbrell*. Digging up tare ground, and reaping wheat.

**TUESDAY**—*Piper*. Reaping wheat. *Dumbrell*. Digging up tare ground, reaping wheat, and hoeing turnips.

**WEDNESDAY**—*Piper*. Cleaning pig sty, and reaping wheat. *Dumbrell*. Transplanting swede turnips, digging up tare ground, and reaping wheat and oats.

**THURSDAY**—*Piper*. Reaping wheat. *Dumbrell*. Mowing oats, and reaping wheat.

**FRIDAY**—*Piper*. Mending lucerne with liquid. *Dumbrell*. Reaping oats, and wheat.

**SATURDAY**—*Piper*. Finished wheat reaping,\* and pulling peas. *Dumbrell*. Mowing oats, reaping wheat, and emptying the privy palls.

### COW-FEEDING.

*Piper*. Cows are feeding upon white turnips, grown upon the land where the rye and tares came off last spring!!

*Dumbrell*. During the week one cow grazed in the day, and fed morn and even with 40lbs. of cabbage. And one cow and heifer stall-fed entirely, with 164lbs. of tares.

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\* *Reaping Corn*.—In the county of Durham, where the cradle scythe is generally employed, practice enables the mower to lay the corn with great nicety; the binders follow him, and in taking up oats, they pass the band round the sheaf very near the ears of corn, and tightly binding it, open out the butt end so that it may stand upon its own base, and set each sheaf, firmly and alone, upon one end, by which means the drying in rainy weather is much facilitated.

### RAPE.

"The immense produce of rape when well manured, is beyond any thing almost that can be imagined."—*Mr. Blacker*.

*Seed Sown*, 1 peck broadcast—or,  $\frac{2}{3}$  peck of Rape, and  $1\frac{1}{2}$  peck of Rye.

This is a very valuable plant for soiling. When you have reason to fear that turnips sown after tares might not attain to proper size, substitute rape; it may be sown in drills and hoed; but for soiling, sow it broadcast from June to September—The early sown, may be cut in November, and again in the following spring—The late sown, will stand over winter, and be the first green food in spring. A little rye mixed with it will be an improvement. Cows, like sheep, greatly relish this plant, neither does it communicate any ill taste to milk. Cut up the rejected woody stems and mix them with turnip or other mash. A crop of turnips may follow both, or winter wheat may follow those sown in June.

### STALL-FEEDING : MR. THORNTON'S EXPERIMENT.

clover and two of mangel wurzel. From the 20th of September to the 16th of October—the roots of the mangel wurzel, from which the leaves were taken, and hay. From the 16th of October to the 12th of November—the leaves of the whole standing crop of mangel wurzel, with hay as usual. From the 12th of November to the 18th of April—mangel wurzel roots and leaves, giving six feeds per day to each cow, and hay between each feed at night—which finishes the year."

#### MR. THORNTON'S EXPERIMENT.

*Three Cows nearly fed throughout the year on Seven roods of land Imperial measure.*

##### *First Year.*

"The land is situate at Paddock, near Huddersfield, the soil poor and sandy, with a subsoil of silicious sand. When first taken into possession, it would not maintain a single cow. The first year I pared and trenched one rood for potatoes, placing the sod in the bottom of the trench; and turned over with the plough two roods to be cropped, in the following spring, with swede turnips. When the rood of potatoes came off, cabbages were placed on the plot, in rows 27 inches apart, and 20 inches from each other in the row. This year I had only one cow, and the produce was entirely consumed in maintaining her.

##### *Second Year.*

"The land was cropped in the following manner. During winter two roods were pared and trenched out of grass, in the manner before mentioned, and planted in the spring with early, and winter potatoes; the rood of cabbages of the first year came off in June, but, previous to their removal, a second crop was introduced into the trenches formed in earthing up the first, by placing manure in them and lightly covering it with earth, placing therein cabbages from the spring seed beds. They were planted in June and cut in October and November. The half acre ploughed the first year, was sown with swede turnips in drills 27 inches apart, which were followed by winter tares and rye; the remaining half acre, being in grass, was partly cut green till the cabbages were ready, the rest made into hay.

Having this year been bold enough to increase my stock, from a single cow, to two cows, and one pig, it became quite apparent that the two cows could not consume the green crops—the pig assisted—the rest went to the dung heap. On reviewing the crops and management, I was convinced that three cows might be maintained, and immediately resolved to make the attempt. After housing my swedes I ploughed the land, and sowed winter tares and rye, for green food in the following spring.

## August.

*Week commencing Monday, August the 21st, 1843.*

### Sussex.

**MONDAY**—*Willingdon School*. Boys carrying wheat and oats. *Eastdean School*. Holyday for the boys, master reaping wheat, hoeing turnips. Mem.—Go over them three times, and then single them by hand. *Piper*. Carrying wheat. *Dumbrell*. Reaping wheat.

**TUESDAY**—*Willingdon School*. Reaping wheat. *Eastdean School*. Boys thrashing peas, turning barley, and planting cabbages for the winter. *Piper*. Thrashing wheat. Mem.—Take care of the chaff to make into mash. *Dumbrell*. Reaping wheat.\*

**WEDNESDAY**—*Willingdon School*. Boys reaping red wheat. *Eastdean School*. Boys cleaning the school, the pigstyes, emptying the tank. *Piper*. Thrashing wheat. *Dumbrell*. Rainy day, attending the cows, &c.

**THURSDAY**—*Willingdon School*. Boys reaping red wheat. *Eastdean School*. Boys emptying the portable privy tubs, carrying contents to the land, and the tank of the pigstyes. *Piper*. Thrashing wheat, and mending lucerne with cow liquid.

**FRIDAY**—*Willingdon School*. Boys reaping red wheat. *Eastdean School*. Boys reaping wheat, turning it to dry, and tying it up. *Piper*. Cleaning wheat and reaping barley. *Dumbrell*. Mowing barley, and oats, reaping wheat.

**SATURDAY**—*Willingdon School*. Boys reaping red wheat, and carrying liquid manure to the rye, about to be sown on stubble. *Eastdean School*. Boys emptying the portable privy pails, and tanks. *Piper*. Reaping barley. *Dumbrell*. Mowing seed tares, and reaping wheat.

### COW-FEEDING.

*Dumbrell*. One cow grazed in the day, and fed in the stall at morn and even with 40lbs. of cabbages till Friday, the remainder of the week with mangel wurzel leaves. Another cow and heifer entirely stall-fed on 164lbs. of tares per day during the week.

*Willingdon School*. Cows feed upon the second cut of clover and white turnip.

*Piper*. Cows feed upon white turnips and lucerne.

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\* *Hainault Scythe*.—Although it comes not within the design of this work to give directions as to the modes of reaping or housing crops, the writer would earnestly suggest, to small farmers, the use of the *Hainault Scythe*, which would facilitate their labours in a very great degree—for a description of it see *Loudon's Ency. of Agriculture*.

## STALL-FEEDING: MR. THORNTON'S EXPERIMENT.

*Third Year.*

"The vetches sown last year, after the swede turnips, were followed by planted swedes, which, before housing were topped for the cows. The cabbage plot, of the first year, was again planted with cabbages, manuring well; and after the crop came off in June, was sown with Italian rye-grass, which gave two cuttings. One-third of an acre after the potatoes of the second year, was sown in April with spring vetches and italian rye-grass, and gave three cuttings; the first of which was made into hay, the second and third were used for stall-feeding. One-third of an acre, trenched partly out of grass for potatoes during winter, was planted with prince regents, part were got early and sold, the remainder were left to ripen; as the potatoes became cleared, cabbages were planted and cut in December. The ground for the cabbages, turnips, and potatoes, is entirely worked by the spade, and the intervals between the rows are well digged. In addition to what my miniature farm produced, I had to expend this year in the purchase of straw, brewer's grains, &c. £11 9s. 9d., but sold in bacon, potatoes, &c., from the farm to the amount of £8 19s. 6d. My stock having been three cows and a farrow of pigs, all of whose food has, with this exception, been derived from it; therefore it is clear, that the three cows have been maintained upon it, with the additional expenditure of £2 10s. 3d. And I feel quite satisfied from the experiment that *high* farming, at any rate on a small scale, will remunerate the individual who dares to adventure much labour on the land.

"My cows are of the short horned breed, very good milkers, and are stall-fed winter and summer. Along with cabbage I give a little Italian rye-grass, the same with potatoe haulm and turnip tops, occasionally adding salt. The green crops serve till christmas—then follow swedes, potatoes with chopped straw, all well steamed, to which is added a little salt. During the winter season each cow, if giving above one gallon of milk per day, has two gallons of brewer's grains with a little bean meal per day. They consume about two tons of purchased straw, which, along with hay, turnips, &c., carry them on till the middle of May, when the rye, rape, tares, and Italian rye-grass come round."

*Effects of Stall-Feeding.* "It has been a common opinion," remarks Mr. THORNTON, "that stall-fed cattle will prove frequently out of calf. Now I feel confident, from four years' experience, this is not the fact. One of my cows has had, under stall-fed management, three calves; is in calf again, and each time, once serving with the bull has sufficed; while the intervals between calving have never exceeded one year and three days. Her time again will be two months within the year. The second cow, under the same treatment, is in her third calf, and, most singular to relate, follows the first cow two or three days in calving. The third cow

## August.

*Week commencing Monday, August the 28th, 1843.*

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### Sussex.

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**MONDAY**—*Willingdon School.* Boys carrying peas. *Eastdean School.* Boys reaping oats, and beans, and tares. *Piper.* Trussing straw.\* *Dumbrell.* Reaping, a wet day.

**TUESDAY**—*Willingdon School.* Half day wet, boys digging early potatoes, and in the school-room. *Eastdean School.* Boys binding sheaves, thrashing barley, digging potatoes. *Piper.* Trussing straw. *Dumbrell.* Mending four rods (121 square yards) with 100 gallons of liquid, turning barley and oats.

**WEDNESDAY**—*Willingdon School.* Boys mowing barley. *Eastdean School.* Boys emptying the portable pails, and tank. *Piper.* Trussing straw, and digging pea ground. *Dumbrell.* Turning peas and oats, reaping wheat, carrying peas and oats.

**THURSDAY**—*Willingdon School.* Boys tying up barley sheaves. *Eastdean School.* Boys thrashing barley, cleaning it, and reaping wheat. *Piper.* Digging pea ground, and sowing white turnips on the same. *Dumbrell.* Binding oats.

**FRIDAY**—*Willingdon School.* Boys thrashing, with machine, the allotment tenants' wheat. *Eastdean School.* Boys cleaning the pigstyes, and emptying the pig-pound tank. *Piper.* Cleaning the pigstye, and mending lucerne with liquid. *Dumbrell.* Binding up, and carrying oats.

**SATURDAY**—*Willingdon School.* Boys doing same as yesterday. *Eastdean School.* Boys emptying portable pails or privy tubs, and clearing the ground where the turnips grew. *Piper.* Digging up potatoes, and housing straw. *Dumbrell.* Carrying oats, raking the stubble.

### COW-FEEDING.

*Willingdon School.*—Cows living on clover and white turnips.

*Dumbrell.*—One cow grazed in the day, and fed morn and even in the stall with mangel wurzel leaves. One cow and heifer stalled on 164lbs. of tares per day, till Thursday, the remainder of the week entirely on clover.

*Piper's Cows* still feeding on lucerne.

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\* *Always thatch your straw well, if you have not room for it within doors—Piper.*

## PREPARE FOR SOWING WINTER TARES, RAPE, RYE, &c., FOR GREEN CROPS.

is four months gone with her second calf, has been twice served with the bull, and will go dry about ten weeks. The two first gave, when first calved, for about ten weeks, ten quarts of milk per meal, and two quarts per day for four weeks before calving. The first gave, when fresh calved, 22 quarts per day, and went dry as above stated."

### LEGUMINOUS STEEP.

"It is better to take heed in time than to repent afterwards, on finding the want of that which we might have had."

*Choosing Seed for Green Crops.*—As so much of your success, next year, will depend upon the green food for spring, that you are now about to provide, use every exertion to ensure good crops of rye, winter tares, but in particular of rape, or what will perhaps be better, mixtures of one or more of these vegetables, for they appear to thrive best together. In choosing tare seed there is a difficulty, as what the dealers sell, is not unfrequently the produce of the spring tare, and the seed of the winter and spring tare are so much alike that we cannot distinguish them. They are, in species, the same plant, but of different habits as to ripening. Where there are allotment tenants, sufficient seed, from the winter tare grown upon somewhat poor soil, ought to be preserved, by one or more of them, for the supply of the whole. Therefore be careful, *very careful*, and do not sow, in autumn, seed produced from the spring tare. Moreover clean the ground well, so that your green crops may not have to struggle with weeds.

*Conversion of the Spring into the Winter Tare.*—In autumn, spring tare seed is sown in a well sheltered situation; if the plants can be preserved during winter, their former habit becomes changed, and their seed, on ripening, will have become what is termed "winter tare seed." It may be sown in autumn, and the plants thus produced, will endure the rigors of winter, and attain early maturity the following spring.

*Steep for Leguminous and other Seeds.*—The following plan of steeping such seeds, has been found, by experience, to answer well for tares, rye, and other seeds, tending, as it must do, to quicken the growth of the young plant. Mix, in a wooden vessel of good size, equal parts of tank liquid and urine; dissolve or macerate therein a few pounds of pigeons' dung, or the dung of fowls, or guano well pounded, and an equal quantity of common salt, and stir all well together; put your seed in a wicker basket, and pour the fluid through it repeatedly, allowing it to drain back into the vessel for future use. Employ gypsum, not quick lime, to divide the seeds, and sow them without delay.

## September.

*Week commencing Monday, September the 4th, 1843.*

### Sussex.

**MONDAY**—*Willingdon School.* Boys thrashing wheat. *Eastdean School.* Boys holyday, master hoeing between the cabbages, and digging potatoes. *Piper.* Digging up potatoes. *Dumbrell.* Carrying barley, and wheat.

**TUESDAY**—*Willingdon School.* Boys thrashing. *Eastdean School.* Boys carrying wheat, thrashing it, and picking turnip leaves for the cows. *Piper.* Cleaning lucerne, and mending it with liquid manure.\* *Dumbrell.* Hoeing turnips, carrying wheat.

**WEDNESDAY**—*Willingdon School.* Boys thrashing wheat. *Eastdean School.* Boys emptying privy tubs, and mixing up cow liquid with mould. *Piper.* Hoeing white turnips after tares, and pulling abundance for the cows.† *Dumbrell.* Thrashing peas.

**THURSDAY**—*Willingdon School.* Boys thrashing wheat and tying up straw. *Eastdean School.* Cleaning wheat, trussing straw, building a wheat rick. *Piper.* Hoeing turnips. *Dumbrell.* Carrying wheat, hoeing turnips.

**FRIDAY**—*Willingdon School.* Cleaning the allotment tenants' wheat. *Eastdean School.* Building two oat ricks, carrying wheat, and cleaning barley. *Piper.* Thrashing barley. *Dumbrell.* Hoeing barley.

**SATURDAY**—*Willingdon School.* Boys cleaning wheat. *Eastdean School.* Boys cleaning the pigstye, and school-room, and emptying the tank. *Piper.* Digging ground for rye sowing. *Dumbrell.* Hoeing turnips, carrying seed, tares and dung with the heifer.

### COW-FEEDING.

*Willingdon School.* Cows living on clover and white turnips.

*Dumbrell.* One cow grazed during the day, and fed in the stall morn and even with mangel wurzel leaves. One cow and heifer entirely stall-fed upon 164lbs. of clover.

\* *Lucerne.*—On the 5th of September, when *Piper* applied liquid to his lucerne, he had already cut it three times during the season, and was on the eve of cutting it the fourth.

† *Turnips after Tares.*—At this season the turnips after tares are, in the south, generally pulled for the cattle, and plenty left to stand the winter for them. *Piper* strongly advises that plenty of manure should be used for the crop of turnips after tares, and observes that if two crops will not pay for well manuring, one crop he feels assured cannot do so.

## GREEN CROPS: RYE, TARES, PLANTED RAPE, AND OTHER MIXTURES.

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"Thresh seed, and sow tares, September doth cry,  
Then dig stubble o'er, and be sowing of rye."—*Piper*.

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"There is no crop which repays the farmer better for the manure he may add to it, than the vetch."—*Farmer's Almanack*. The same may be remarked of the other green crops.

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## RYE.

*Seed Sown, in drills for soiling, 2½ bushels—broadcast, 3½ bushels per acre.*

*Time of Sowing, from the middle of August to the middle of September, but the earlier the better, as late sowing requires an increase of seed. "Rye is of the same double quality of green and seed crop," requiring not so good a soil and climate as wheat. The crop, for soiling, is taken, as a stolen crop, on stubbles—stable manure being incorporated with the soil, when turned over; or 25 gallons of tank liquid per rod having been applied, the seed may be plentifully sowed, so that the crop being thick, whether in the drill or otherwise, it may be cut the sooner; but although it comes to early maturity, and is so far valuable, it does not appear to possess equal nutritive power to rape.*

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## WINTER TARE, OR VETCH.

*Seed Sown, in drills for soiling, 2½ bushels—broadcast, 4 bushels per acre.*

*Time of Sowing, as early in the month as possible; and it may be sown either in drills, at six inches distance, or broadcast, the seed being deposited at a depth of about two inches, adding as much moulded manure as can be spared, always keeping the above remark in view. The drill may be formed with a wheat hoe, and the growing crop afterwards kept clean. One-third, by measure, of rye seed is usually mixed with the winter tare—the rye plant supporting the tare. Theory informs us that the vetch hay possesses high nutritive powers, and although it may be too coarse to be relished as dry food, it might, perhaps, be chopped up and steamed along with turnips, into a nourishing and agreeable mash for cattle.*

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## RAPE, RYE, AND TARES MIXED.

*Sow during this month and till the middle of October, mixtures of these useful seeds for green crops. Let the rape be in the proportion mentioned at page 25; this plant will shelter and succour the tare and rye during winter, and the crop will be brought forward at the time when it is most wanted in the spring.*

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*Planting Rape.* As soon as the stubbles are cleared, dig the ground, as you go on, and transplant rape, from a seed bed sown in June. If the plough be used, let children drop the plants, twelve inches apart in the scrape of the furrow; the succeeding furrow slice will cover them; a man, following the plough, must afterwards affix the plants more firmly in the ground.

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\* \* \* Manuring will be of advantage to all such crops as these, and when applied do not bury the manure too deep, just cover it up, and no more; for every shower that falls, has a tendency to carry the soluble part of it still deeper.



## September.

*Week commencing Monday, September the 11th, 1843.*

### Sussex.

**MONDAY**—*Willingdon School.* Boys carrying red wheat. *Eastdean School.* Boys had holyday, master digging up potatoes, cleaning barley. *Piper.* Preparing wheat stubble for rye or tares. *Dumbrell.* Mowing stubble, carrying dung with the heifer, thrashing tares and wheat.

**TUESDAY**—*Willingdon School.* Boys carrying barley, getting out liquid manure for rye. *Eastdean School.* Digging tare ground, hoeing cabbages, cleaning school-room. *Piper.* Digging potatoes. *Dumbrell.* Mowing stubble, thrashing wheat, carrying out dung with the heifer.

**WEDNESDAY**—*Willingdon School.* Boys digging for rye as spring food. *Eastdean School.* Boys emptying the privy tubs, tank, and cleaning tares. *Piper.* Digging up potatoes. *Dumbrell.* Mowing stubble, carrying dung with the heifer.

**THURSDAY**—*Willingdon School.* Boys digging for rye. *Eastdean School.* Boys thrashing beans and wheat, and cleaning the pigstyes. *Piper.* Digging potatoes. *Dumbrell.* Mowing stubble, carrying dung.

**FRIDAY**—*Willingdon School.* Boys digging for rye. *Eastdean School.* Cleaning school-room, &c., taking off turnip leaves for the cows. *Piper.* Preparing dung heap. *Dumbrell.* Mowing stubble, thrashing wheat, carrying dung with the heifer.

**SATURDAY**—*Willingdon School.* Boys digging for rye. *Eastdean School.* Boys cleaning school-room, emptying the privy tubs, and gathering turnip leaves for the cows. *Piper.* Digging up potatoes. *Dumbrell.* Mowing and raking stubble, carrying manure with the heifer, thrashing wheat.

### COW-FEEDING.

*Willingdon School.* Cows living upon clover and white turnips.

*Dumbrell.* One cow grazed in the day, fed in the stall morn and even with mangel wurzel leaves. One cow and heifer stall-fed entirely, with 164lbs. of clover for six days, and one day upon tares.

*Piper's* cows living upon white turnips and lucerne, in the stall.

N.B. Always keep your cows within doors at nights, for now is the time they will get low in condition if you are not very careful. Let them have a little extra food; if you have any chaff, give them each about a gallon of it, mixed with a gallon of potatoes, twice a day. If they happen to have the yellows, a complaint caused by obstructed perspiration, the following is a good remedy for it, viz.—3 oz. of soft soap, 3 oz. of carraway seeds, and 3 pints of beer boiled well together.

### ROTATION OF CROPS.

"It is only by imitating the rural economy of foreign countries—by obtaining a quick succession of green crops—and by losing no opportunity to intercalate tares, rye, turnips, scarlet trefoil, Belgian carrots, and above all, by landlords making homesteads in a condition capable of collecting and preserving every atom of manure, that the agriculture of Great Britain will be able to keep pace with her steadily increasing population."  
—Rev. W. Thorpe.

*a conclusion of the Agricultural year being now approaching, we ought to mature our plans as regards succeeding crops, and, from the practices of others learn to improve our own.*

#### FACTS.

Corn crops, if thin, and bearing seeds,  
Are great encouragers of weeds;  
And where, in quick succession found,  
Are sure, at length to exhaust the ground,

#### RULES.

Let other crops, as well as corn,  
At distant intervals return.  
Between each crop of grain ensure  
Root crops, requiring much manure;  
Or turn your stubbles o'er with speed,  
And let *green crops* your corn succeed.  
Prefer such crops as need the hoe,  
For, weeds on land should never grow.  
And when laid down to grass, take care  
'The land's in heart, and no weed there.

#### PROBABILITIES.

One plant may do another good,  
By voiding what becomes its food;  
Or from the soil that food select,  
Which plants of other tribes reject.  
Or *Nitre*\* form'd beneath its shade,  
The growth of different kinds may aid.  
Whate'er the cause—experience drops  
The hint—to often change our crops.

*White or scourging crops.*—Wheat, barley, oats, rye, &c., maturing in seeds.

*Enriching or restorative crops.*—Potatoes, mangel wurzel, turnips, bages, &c., and artificial grasses known by the term *green crops*.

"May if you but forbid the sunne. If you do but pluck (i.e. shade) the ground it will breed nitre."—Bacon.

## September.

*Week commencing Monday, September the 18th, 1843.*

### Sussex.

**MONDAY**—*Willingdon School.* Boys carrying out solid manure for winter tares after rye, for spring food. *Eastdean School.* Nine boys digging and picking stones, rest gleaning with the farmers. *Piper.* Digging up potatoes, and preparing ground for wheat. *Dumbrell.* Stacking stubble, hoeing turnips, thrashing wheat.

**TUESDAY**—*Willingdon School.* Boys carrying manure out. *Eastdean School.* Boys gleaning the stubbles, digging the ground where the tares were grown. *Piper.* Digging up potatoes. *Dumbrell.* Carrying dung with the heifer, hoeing turnips, thrashing wheat.

**WEDNESDAY**—*Willingdon School.* Boys digging up early potatoes. *Eastdean School.* Boys emptying the portable pails, and breaking leaves from the turnips. *Piper.* Hoeing turnips. *Dumbrell.* Raking stubble, thrashing and winnowing wheat, carrying dung with the heifer.

**THURSDAY**—*Willingdon School.* Boys digging up early potatoes. *Eastdean School.* Boys emptying the pigstye tank, carrying contents to the wheat stubble. *Piper.* Digging up potatoes, mixing up manure. *Dumbrell.* Raking stubble, thrashing wheat, digging and carrying potatoes, and dung with the heifer.

**FRIDAY**—*Willingdon School.* Boys digging up early potatoes. *Eastdean School.* Boys picking weeds from potatoes and carrots, and carrying them to the pigs.\* *Piper.* Digging wheat stubble, for rye and tares. *Dumbrell.* Stacking stubble, thrashing wheat, digging potatoes, carrying manure.

**SATURDAY**—*Willingdon School.* Boys thrashing peas for the pigs. *Eastdean School.* Boys holyday, master digging up potatoes for the pigs, &c. *Piper.* Digging up potatoes. *Dumbrell.* Mowing stubble, carrying dung.

### COW-FEEDING.

*Willingdon School.* Cows fed on clover, white turnips, and a little chaff.

*Dumbrell.* One cow grazed in the day, stall-fed morn and even with mangel wurzel leaves. One cow and heifer stall-fed with tares.

N.B. Look carefully to your stock all this month and next; if you do not they will get low in condition.

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\* *Early Barley for Pigs.*—Have some of your early barley ground for the pigs as soon as thrashed, and mix it well with boiled potatoes; one bushel now will do them as much good as two in cold weather; be very careful to smash all your potatoes, and let them be given only just warm.

### ROTATION OF CROPS.

A diversity of opinion, however, exists, as to what exact green crop should follow a white crop in succession, and hence the great variety of rotations in use, which are spread over different periods of time, from two to eight years and upwards. The circumstances of soil, climate, and markets, may make one course improper in one place, which would be highly judicious in another; but by keeping strictly in view, the rules above described, a selection can generally be made, with occasional variations from the following forms, aided by the accompanying remarks.

#### *Two Years' Rotations.*

I.—1st year Potatoes. 2nd year Wheat.

II.—1st „ Beans. 2nd „ Wheat.

*Obs.* The 1st rotation is that which will be referred to hereafter, and was followed with extraordinary success by S. BRIDGES, and the Allotment tenants of Sir G. CAYLEY, the land becoming gradually improved, after practicing it a number of years.

The 2nd rotation has been known to improve land in a high degree. But these rotations can only be conducted where manure is very abundant.

#### *Three Years' Rotations.*

I.—1st year Swede Turnips 2nd year Barley 3rd year Clover

II.—1st „ Potatoes 2nd „ Wheat 3rd „ Clover

III.—1st „ Winter Tares 2nd „ Wheat 3rd „ Clover

*Obs.* No. 1. In this rotation the swedes will require to be consumed by sheep folded on the ground, but, every second row may be drawn away for other uses.

No. 2. This will require the potatoes to be well manured.

No. 3. This is a self-supporting course, and does well at a distance from manure, but the clover returns too soon in the rotation and must be changed, or will sicken.

#### *Four Years' Rotations.*

| 1st Year.                           | 2nd Year. | 3rd Year. | 4th Year.                            |
|-------------------------------------|-----------|-----------|--------------------------------------|
| I.—Turnips                          | Barley    | Clover    | Oats                                 |
| II.—Winter Tare followed by Turnips | Wheat     | Clover    | Oats                                 |
| III.—Turnips                        | Wheat     | Grass     | Four-fifths Wheat and one-fifth Oats |
| IV.—Turnips                         | Wheat     | Clover    | Oats                                 |
| V.—Turnips                          | Wheat     | Clover    | Wheat                                |
| VI.—Potatoes                        | Wheat     | Clover    | Oats                                 |

*Obs.* No. 1. Is the famous Norfolk course—it requires the turnips to be consumed on the ground by sheep.

No. 2 Is an enriching course, containing two green crops in the first year's rotation, the turnips being eaten on the ground.

## September.

*Week commencing Monday, September the 25th, 1848.*

### Sussex.

**MONDAY**—*Willingdon School.* Boys carrying out liquid manure for tares, and making dung heap. *Eastdean School.* Twelve boys digging up potatoes, gathering the haulm, and clearing the ground. *Piper.* Digging up potatoes. *Dumbrell.* Mowing stubble, thrashing wheat, carrying dung.

**TUESDAY**—*Willingdon School.* Boys cleaning clover ley for wheat. *Eastdean School.* Boys digging ground for wheat, digging up wheat stubble for rye. *Piper.* Preparing dung mixen. *Dumbrell.* Mowing stubble, digging up oats stubble for rye.

**WEDNESDAY**—*Willingdon School.* Boys cleaning clover ley for wheat. *Eastdean School.* Carrying the contents of the tank and privy tubs to the wheat stubble. *Piper.* Preparing dung heap. *Dumbrell.* Mowing stubble, digging.

**THURSDAY**—*Willingdon School.* Boys cleaning clover ley for wheat. *Eastdean School.* Digging up potatoes, and healing up for winter, picking weeds from the mangel wurzel. *Piper.* Digging potatoes. *Dumbrell.* Winnowing wheat, raking stubble.

**FRIDAY**—*Willingdon School.* Boys hoeing white turnips sown after oats.\* *Eastdean School.* Boys sowing rye for green food, mowing stubble, and manuring. *Piper.* Digging up potatoes. *Dumbrell.* Digging up wheat stubble for rye.

**SATURDAY**—*Willingdon School.* Boys sowing rye, and dressing the ground. *Eastdean School.* Boys emptying the privy pails, and cleaning the school-room. *Piper.* At indoor work, the weather being wet. *Dumbrell.* Digging.

### COW-FEEDING.

*Willingdon School.* Cows living on clover, and white turnips, with chaff.

*Dumbrell's.* One cow grazed in the day, stall-fed morn and even with mangel wurzel leaves. One cow and heifer stall-fed with tares till Friday, the remainder of the week staked out on young clover, and fed morn and even with tares.

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\* *Turnips make Manure.*—Some people will say, "these after or stolen crops of turnips, as above, will be too expensive for a poor farmer;" now when you hear any body say this, just ask him if it will injure a poor farmer to have a good crop and more manure, and then ask him to shew you some better, and cheaper, way of getting manure, than by double cropping your land.

### ROTATION OF CROPS.

- . An improving rotation.
- . Is a productive rotation, much followed in Scotland.
- . The Dunbar rotation, requiring much manure.

#### Five Years' Rotations.

| Year.               | 2nd Year | 3rd Year. | 4th Year. | 5th Year. |
|---------------------|----------|-----------|-----------|-----------|
| Turnips             | Barley   | Clover    | Beans     | Oats      |
| Potatoes or Turnips | Barley   | Clover    | Pasture   | Oats      |

No. 1. By allowing the clover to stand for two years, the four course may be converted into a five course shift.

2. Will require the clover and beans to be consumed on the farm by sheep.

Vide *Agricultural Chart*, by W. Howly, Esq.

#### ROTATION CROPS FOR A COTTAGE ALLOTMENT, OR SMALL FARM OF SEVERAL ACRES.

|                                                       |   |                                                       |
|-------------------------------------------------------|---|-------------------------------------------------------|
| Wheat, Oats, or Barley, laid down in Clover.          | B | Wheat, Oats, or Barley, laid down in clover.          |
| Clover for soiling.                                   |   | Clover for soiling.                                   |
| Autumn Potatoes, followed by Rape or Stubble Turnips. |   | Autumn Potatoes, followed by Rape or Stubble Turnips. |
| Winter Potatoes.                                      |   | Winter Potatoes.                                      |
| Tares, followed by Rape or Stubble Turnips.           |   | Tares, followed by Rape or Stubble Turnips.           |
| Winter Potatoes.                                      |   | Winter Potatoes.                                      |
| Turnips.                                              | A | Turnips.                                              |
| House, Offices, and Yard.                             |   | Garden.                                               |

1. To B a path is laid down dividing the plots, by which manure is wheeled to the yard, and more easily applied to the right or left hand beds, both on the same crop.

plan the same crop returns once in seven years; for instance, take the first year, which suppose cropped with wheat, oats, or barley the present year; second or next year it will be cropped with clover, the third year with potatoes, and when they come off, with a stolen or double crop that year. In the fourth year's crop will be winter potatoes, &c.; after the seventh year the crop will be followed by wheat, &c. Or, take another example. In the fourth year winter potatoes will be followed by tares and a stolen or second crop, then potatoes the sixth year. Thus, according to Mr. BLACKER'S design, on a farm, supposing the house, offices, &c., and garden to occupy one rood, the arduer will have one rood of grain, one rood of turnips, three roods of one rood of tares, one rood of clover, two roods of stolen crop, viz. rape, &c., and stubble turnips after early potatoes.

## October.

*Week commencing Monday, October the 2nd, 1843.*

### Sussex.

**MONDAY**—*Willingdon School*. Boys hoeing white turnips sown after oats. *Eastdean School*. Fourteen boys digging up potatoes, and clearing ground for wheat. *Piper*. Digging up potatoes. *Dumbrell*. Digging.

**TUESDAY**—*Willingdon School*. Boys turning dung and mould heap, to be ready for wheat. *Eastdean School*. Digging up potatoes, healing them for winter, and stone picking. *Piper*. Carrying chalk upon the potatoe ground intended for wheat. *Dumbrell*. Digging.

**WEDNESDAY**—*Willingdon School*. Digging stubble for winter tares. *Eastdean School*. Boys emptying the pigstye tank, gathering stones. *Piper*. Carrying chalk as before. *Dumbrell*. Digging.

**THURSDAY**—*Willingdon School*. Boys digging for winter tares. *Eastdean School*. Boys digging potatoe ground, and picking up the haulm. *Piper*. Sowing rye. *Dumbrell*. digging, hoeing turnips, thrashing tares, applied 24 gallons of liquid manure to one rod of ground, for rye.

**FRIDAY**—*Willingdon School*. Boys digging for winter tares. *Eastdean School*. Wet weather, boys in the school all day. *Piper*. Digging wheat stubble for tares. *Dumbrell*. Sowing rye, thrashing barley.

**SATURDAY**—*Willingdon School*. Boys thrashing barley, the weather being wet. *Eastdean School*. Boys emptying the portable tubs and tank, cleaning styes and school-room. *Piper*. The same as before. *Dumbrell*. Winnowing barley, tares, thrashing oats, and harrowing.

### COW-FEEDING.

*Willingdon School*. Cows feeding on white turnips and a little chaff.

*Piper*. In the morning a little clean straw while cleaned out, while milking, a gallon of potatoes mixed with chaff, afterwards turnips or tares.

*Dumbrell's*. One cow stall-fed with Italian rye grass, and white turnips till Tuesday night, afterwards with Italian rye grass and lucerne. One cow and heifer staked out on the young clover, and fed morn and even with tares, potatoes, and wheat chaff till Friday night. On Saturday, stall-fed with turnips, potatoes, carrots, and barley chaff.

## WINTER WHEAT : PICKLE : PRECAUTIONS IN SOWING.

### WINTER WHEAT.

*Seed Sown, broadcast, 3 bushels—in drills, 2 bushels—when Drilled at 6 inches distance, 1 bushel per acre.*

*Time of sowing, &c., from September to December.* But, the poorer the soil, and the later the sowing, the more seed must be used, and in selecting your seed wheat always bear in mind what the poet says in the following lines:—

“But ill shall he speed,  
That soweth ill seed.”—*Tusser.*

If possible, bring the seed from a poorer, colder soil, and let it be perfectly free from smut, and weeds. Prefer white wheat for rich, red for inferior soils; and remember, whether this crop may have been preceded by a summer fallow, or other crop, that a due supply of lime to the soil will be required, in order that the potash, by its agency, being set free, may enable the silica or *silicious earth* therein, to enter into the structure of the wheat plant—where its presence is indispensable.

*Pickle for Wheat.*—There is none perhaps better than this, for the small farmer or field-gardener—dissolve common salt in urine, in a good large vessel, till the solution is strong enough to carry an egg upon its surface. Then take a hand basket partly filled with wheat, which plunge beneath the fluid, and stir the wheat for ten minutes, not more; the bad seeds will rise to the top, and may be skimmed off. Withdraw the basket, and let the fluid drain back again into the vessel. Mix the steeped seed with lime to make it part, or what, perhaps would be better, with gypsum, which will not expel ammonia from the urine. Sow immediately and harrow in, and if you are not able to do so, spread it evenly on a boarded floor, or its vitality may be destroyed.

“Who soweth in rain,  
Hath weed for his pain.”—*Tusser.*

*Precautions in Sowing Wheat.*—Sow first your clover ley, or rye, or tare stubble ground. Always let your ground be fresh, turn it over in the morning, and sow in the afternoon, but never in wet weather. The above trite remark of the good old poet-farmer will be found generally true. The wheat sowing after potatoes, or turnips will come latest, to allow time for those crops to become matured. But again the advice of *Tusser* is sound:—

“If weather will suffer this counsel I give,  
Leave off sowing wheat before Hallowmas eve.”

In the north of England this can rarely be accomplished, especially after a late harvest. But let not a moment be lost, in preparing the ground and sowing wheat, not on tare or other stubbles alone, but after your root crops generally.



## October.

*Week commencing Monday, October the 9th, 1843.*

### Sussex.

**MONDAY**—*Willingdon School*. Boys digging for winter tares. *Eastdean School*. Sixteen boys digging up, and gathering potatoes, *Piper*. Turning dung heap, and emptying tank. *Dumbrell*. Thrashing oats, sowing rye and tares.

**TUESDAY**—*Willingdon School*. Boys thrashing two bushels of wheat, to go to Yorkshire for seed. *Eastdean School*. Boys digging, &c., for rye. *Piper*. Chalking the potatoe ground for wheat. *Dumbrell*. Harrowing, digging, thrashing oats.

**WEDNESDAY**—*Willingdon School*. Wet weather, tying up straw in the barn. *Eastdean School*. Boys digging up stubble, manuring, and sowing winter tares. *Piper*. Sowing rye. *Dumbrell*. Thrashing oats, trussing straw.

**THURSDAY**—*Willingdon School*. Boys digging for winter tares. *Eastdean School*. Emptying tank and piggery, gathering potatoe haulm. *Piper*. Digging wheat ground for tares, *is very particular in taking out weeds*. *Dumbrell*. Thrashing oats, trussing straw.

**FRIDAY**—*Willingdon School*. Boys digging for winter tares. *Eastdean School*. Boys carrying manure for wheat, picking out weeds. *Piper*. Sowing tares by hand in the drills. *Dumbrell*. Thrashing oats, digging.

**SATURDAY**—*Willingdon School*. Boys sowing winter tares. *Eastdean School*. Boys emptying portable pails, cowhouse tank, school cleaning. *Piper*. Sowing tares. *Dumbrell*. Winnowing oats.

### COW-FEEDING.

*Willingdon School*. Cows feeding on white turnips, clover, and a little chaff.

*Piper's*. Feeding as before.

*Dumbrell's*. One cow stall-fed till Tuesday, with Italian rye-grass, and cabbage. On Wednesday, with mangel wurzel leaves, turnips, and oat chaff. Thursday, potatoes, turnips, mangel wurzel leaves, green rye, oat chaff. Friday and Saturday, with Italian rye-grass, oat chaff. One cow and heifer, on Monday, stall-fed on white turnips and tares. Tuesday, staked out on the young clover, and fed morn and even with carrots, tares, and straw. Wednesday, stall-fed on potatoes, turnips, carrots, and oat chaff. Thursday, staked out in clover, stall-fed with turnips, carrots, tares, oat chaff. Friday and Saturday the same.

## DRILLING WHEAT : DIBBLING : COMPOSTING MANURE.

"He who trieth to make no improvement, improvement none shall he make."—*Old Proverb.*

**Drilling Wheat.**—"Drill all you can, for there are few soils where the drill cannot be easily employed."—*Farmer's Almanack*.<sup>\*</sup> There are two modes of drilling, the first by using a hand drill, like John Dumbrell, which opens the drill, and puts the seed in at the same time; and like him you may invent and construct one, for your ensuing winter evenings' amusement. The second mode is to open the drills with a hoe, at six inches distance from each other, and two and a-half inches deep, while a boy comes after and drops the seed, walking in the drill line as he returns, after which a harrow is drawn over it at night. About five or six bushels of mouldy manure per rod, is put upon the seed. To estimate manure by the bushel, if it raise a smile, may remind us of China, where they know its value, and sell it by the pint.

**Dibbling Wheat.**—"Dibble, also, all you can, it employs poor neighbours, and their children, and it is believed that the saving in seed, is equal to the additional expense."—*Farmer's Almanack*. It is becoming common to do so, even on large farms; the present practice is to place the seeds at a distance of six inches every way from each other, and two or two and a-half inches in depth. They tiller amazingly, and the ears and grain acquire greater bulk. It has been calculated that an imperial bushel of new red wheat, which weighed 63lbs., contained 635,448 grains; a quarter, on this principle, would be sufficient to plant 28a. 1r. 1p. of land, being after the rate of one peck and nine-sixteenths of a pint per acre.—*Farmer's Magazine*.

**Method.**—In dibbling, steep your seed wheat in urine, use a little quick lime, and a good deal of rape dust to make it part. Let your rows be six inches apart, strike four holes at a time, *six inches* distant, *three inches* deep; place, as near as you can guess, three seeds in each hole, cover up immediately, and tread the seeds well in as you go on, and at night *bush harrow* the space you have dibbled during the day.

"A cock, at labour on the dunghill, found a precious jewel. 'Ah!' says he, 'of less use wilt thou be to me than so much dung; for it helps to produce the food which keeps me alive, when thou art fit only to be gazed upon.'"—*Fable*.

**Composting Manure.**—While these necessary labours of the season are in progress, in rainy weather attend to your mixens, and compost mould and dung together; some one may say, "Where is the mould to be procured?" While you may reply, "Every one that has *land* is not without *mould* of some sort or other." Then again

<sup>\*</sup> Always have at your fire side the *Farmers' Almanack*, edited by C. W. Johnson, Esq. F.R.S., and Wm. Shaw, Esq., which, at the expense of a Christmas shilling, may be the means of putting many pounds into your pocket.

## October.

*Week commencing Monday, October the 16th, 1843.*

### Sussex.

**MONDAY**—*Willingdon School.* Boys digging for wheat, carrying manure. *Eastdean School.* Seventeen boys digging up potatoes, gathering stones, and gathering haulm for the pigstyes. *Piper.* Mowing tares, and rye, digging up potatoes, turning over, and mixing tank liquid with the dung.\* *Dumbrell.* Digging.

**TUESDAY**—*Willingdon School.* Boys digging, master and one boy drilling wheat. *Eastdean School.* Boys sowing tares, digging up potatoes, and storing them. *Piper.* Digging up and storing carrots, sowing rye as we remove them. *Dumbrell.* Digging.

**WEDNESDAY**—*Willingdon School.* Boys digging for wheat, and sowing. *Eastdean School.* Boys emptying pigstye tank, and applying its contents to the wheat. *Piper.* Sowing rye, till showery weather prevented us. *Dumbrell.* Digging, and carrying dung with heifer.

**THURSDAY**—*Willingdon School.* Boys digging for wheat, and sowing. *Eastdean School.* Boys digging for tares, picking mangel wurzel leaves for the cows. *Piper.* Sowing wheat. *Dumbrell.* Digging and drilling tares, carrying dung, and liquid manure, to the ryegrass; 84 gallons to 2½ rods, or 75½ square yards.

**FRIDAY**—*Willingdon School.* Boys digging, and sowing wheat. *Eastdean School.* Boys emptying privy pails, cleaning school-room, and cow-shed. *Piper.* Sowing wheat, carrying manure with the cow. *Dumbrell.* Digging, drilling tares, &c.

**SATURDAY**—*Willingdon School.* Boys digging for wheat, and sowing. *Eastdean School.* Boys digging for wheat, and picking stones, and haulm, and drawing manure. *Piper.* The same as yesterday. *Dumbrell.* Digging.

### COW-FEEDING.

*Willingdon School.* Cows feeding on white turnips, clover, and chaff.

*Dumbrell's.* One cow fed part of the week in the stall with mangel wurzel leaves, carrots, and oat chaff with turnips, occasionally with a few potatoes, and staked out in the wheat stubble one day. One cow and heifer staked out on wheat stubble four days, and fed morn and even with carrots, and oat chaff, entirely stall-fed two days, on the same materials.

\* *Compost Heap.*—At this time *Piper* has about 50 cart loads of composted manure, (pretty well for a five acre farm,) the fruits of his care and industry. He will sprinkle upon it about 200 gallons of tank liquid two or three times before it is used.

### POTATOE HARVEST: WHEAT AFTER POTATOES.

it may be said, "Where are we to get dung?" And your answer at once may be, "By growing plenty of food for cattle."

It may be said that there is an immense deal of trouble with these dung mixens; it is very true, but we can get nothing in this world without trouble; the *real* question is this, not whether you have great trouble from it, but whether it will *pay* you for your trouble?

Be not afraid of getting too much manure, and if you neglect the chief object, yours will be a failure, while with manure in abundance, you can take double crops and increase your stock.

*Potatoe Harvest.*—Having completed the sowing of winter wheat on stubbles, clover ley, &c., the potatoe harvest naturally follows—Do not delay the gathering of this crop after it is fully matured, that wheat may be sowed in good time. As you remove the roots, let the spaces between the several rows, be well digged up with the fork, and all the weeds removed: by doing which the ground will be quite clean and ready for drilling or dibbling wheat as you proceed with the potatoe getting.

*Drilling, &c. Wheat after Potatoes.*—Clear away two or three rows of potatoes at once, draw your drills as before directed, and drill or dibble the wheat as you proceed, on the latter plan let your seeds be placed six inches asunder, two and a half or three inches deep, cover up and tread well in.

"I wisdom dwell with prudence, and find out knowledge of witty inventions."—*Prov. viii. 12.*

*Sowing Wheat broadcast after Potatoes.*—Sir WILLIAM PULTENEY described, long ago, the cultivation of a little farm near Shrewsbury, of one acre and one-sixteenth, and cropped, with great success for many years, with potatoes and wheat alternately; his description of the sowing of wheat, adopted by the cottager and his wife, is as follows:—"In October, when the potatoes are ripe, she shakes off all the stalks, or haulm of the potatoe, which she secures, to produce manure, by means of her pig. She then goes over the whole with a rake, and takes off all weeds, and before taking up the potatoes, she sows her wheat, on as much ground as she can clear of potatoes that day. They are taken up with a three-pronged fork, in which her husband assists, and by the same operation, the wheat is covered up. She leaves it quite rough, and the winter frost mellows the earth; and by the earth falling down, it adds much strength and vigour to the wheat plants in the spring. Her crops of wheat have been, of late years, always good, and even the present year, which in this country has not been favourable to the wheat crop, she has thrashed out fifteen Winchester bushels from thirty-four rods of land."—See 'Cottage,' *Farmers' Assistant*, by C. W. Johnson, F.R.S., &c.

## October.

*Week commencing Monday, October the 23rd, 1848.*

### Sussex.

**MONDAY**—*Willingdon School*. Boys digging for wheat, and the master drilling. *Eastdean School*. Seventeen boys digging up potatoes, gathering up haulm, and stones. *Piper*. Sowing wheat, in drills six inches apart, and two or three deep. *Dumbrell*. Digging up potatoes, and carrying manure.

**TUESDAY**—*Willingdon School*. Boys carrying out manure. *Eastdean School*. Boys digging for wheat, and clearing off swede turnips. *Piper*. Sowing wheat in drills. *Dumbrell*. Digging up potatoes, heifer drawing dung.

**WEDNESDAY**—*Willingdon School*. Boys digging for wheat. *Eastdean School*. Boys emptying the pigstye tank, digging for, and sowing wheat. *Piper*. Sowing wheat. *Dumbrell*. Digging, mixing dung and mould, heifer carrying dung.

**THURSDAY**—*Willingdon School*. Boys digging, and drilling wheat. *Eastdean School*. Boys drawing manure for wheat, cleaning pigstyes. *Piper*. The same as yesterday. *Dumbrell*. Drilling fourteen rods of tares,\* storing in the cellar mangel wurzel roots.

**FRIDAY**—*Willingdon School*. Boys digging for wheat. *Eastdean School*. Boys sowing tares, digging for wheat, gathering mangel wurzel leaves, and stones. *Piper*. As before. *Dumbrell*. Digging up carrots, potatoes, heifer dung carrying.

**SATURDAY**—*Willingdon School*. Boys digging for, and drilling wheat. *Eastdean School*. Boys emptying portable pails, cleaning the school, planting cabbages. *Piper*. As before. *Dumbrell*. Mixing dung and mould, pulling mangel wurzel roots.

### COW-FEEDING.

*Willingdon School*. Cows feeding on white turnips, &c. as before.

*Piper's*. In addition to other food, is giving two gallons of carrots per day.

*Dumbrell's*. One cow staked in the rye-grass, and fed in the stall morn and even, on mangel wurzel leaves, for four days. Stall-fed with mangel wurzel leaves, turnips, and oat chaff, for two days. One cow and heifer staked on clover, and morn and even fed with potatoes, carrots, and oat chaff, for three days, the remaining three, stall-fed with turnips, potatoes, and oat chaff.

\* *Tares*.—Now drill your second crop in by hand, with a wheat hoe, and scatter a little manure in every drill.

### CURIOUS INSTANCES: CABBAGES AFTER WHEAT.

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Their joy will be, continually, in the success of their labours; their thoughts shall be turned away from what is evil, to that which is good.

*Potatoes and Wheat in succession.*—"On Sir G. CAYLEY'S allotments, it is usual to have one-half in wheat, the other half in potatoes, changing the crops every year, the part in wheat of one year, being cropped the year following with potatoes, and *vice versa*. On this short duration the land has not diminished, but actually increased in fertility. For the last ten years, the produce of wheat has been 40 bushels to the acre, in some cases 54, while for the twenty years preceding, 36 bushels was the average. The half acre of potatoes, and others supplied by the garden, are usually consumed by the pigs. Cottagers have been known to sell twenty pounds worth of pigs, besides their families being well supplied with bacon!! And some cottagers, who have the happy fortune to be blessed with careful wives, and good cows, have sent 12lbs. of butter to market per week, during the flush of the feed."

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"He that tilleth his land, shall have plenty of bread."

Another instance of a quick succession of crops is that of S. BRIDGE, of Stock Green, near Feckenham, Worcestershire. He cultivates four acres of poor land entirely by the spade. His crops for the most part are successively wheat and potatoes. This he has followed with great success for 24 years. As soon as the wheat is off, he breast-ploughs his stubble ground, raking up the stubble to litter the pigs. He then digs it over with a fork, and plants potatoes in the following spring; this crop being kept clean, the land needs no further preparation for wheat. His average produce has been 40 bushels of wheat per acre, and twelve tons of potatoes per acre. The source of manure is the pigs which he keeps upon a part of the produce; the potatoe haulm, stubble, and straw, are of course, carefully husbanded for this purpose.

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### LATE CABBAGES AFTER WHEAT.

Empty the contents of the *Portable Pails* upon a good deal of mould and make a rich compost. Having dug up a portion of wheat stubble and worked the soil into fine tilth, open trenches, which, fill with this compost and transplant therein early *York*, or early *Hope* cabbages from the seed bed, so that each plant may occupy its square yard of space, leaving sufficient room for intruding as many rows of Scotch cabbages about the May following as there are now rows of early *Yorks*, &c., that by the time the latter come to maturity and require removing, the Scotch may have space left for their future progress. It appears by Mr. J. BAMFORD'S trials, near Slaithwaite, that from the humidity of the climate or other causes, the high bleak mountains in the West of Yorkshire are well adapted for the growing of succulent plants, and that cabbage in particular thrives with luxuriance.

## October.

*Week commencing Monday, October the 30th, 1843.*

### Sussex.

**MONDAY**—*Willingdon School.* Wet weather, boys in school all day. *Eastdean School.* Wet, boys cleaning up the cellar, assorting potatoes.\* *Piper.* Sowing wheat. *Dumbrell.* Wet weather, digging up a few potatoes.

**TUESDAY**—*Willingdon School.* Wet weather, boys in school all day. *Eastdean School.* Wet day, boys in the afternoon platting straw, to make themselves hats. *Piper.* Thrashing barley. *Dumbrell.* Digging up carrots, hoeing mangel wurzel.

**WEDNESDAY**—*Willingdon School.* Boys digging for wheat. *Eastdean School.* Boys digging for wheat, emptying pigstye tank, picking stones, and haulm. *Piper.* Thrashing barley. *Dumbrell.* Digging up carrots, storing mangel wurzel.

**THURSDAY**—*Willingdon School.* Boys digging for wheat. *Eastdean School.* Boys digging up, and storing potatoes, drawing drills, sowing wheat, and treading the ground. *Piper.* The same as yesterday. *Dumbrell.* Digging up carrots and potatoes.

**FRIDAY**—*Willingdon School.* Boys digging for wheat. *Eastdean School.* Boys pulling and storing swede turnips, and gathering up weeds. *Piper.* The same as before. *Dumbrell.* Digging up carrots, and potatoes, heifer carrying dung and potatoes.

**SATURDAY**—*Willingdon School.* Boys carrying solid and liquid manure to the wheat. *Eastdean School.* Boys emptying portable pails, cleaning school-room, and pigstyes, and getting Sunday food for the cows. *Piper.* Winnowing barley. *Dumbrell.* Digging carrots, and turnips, topping them, heifer carrying dung.

### COW-FEEDING.

*Willingdon School.* Cows feeding on white turnips, with a little barley straw.

*Dumbrell's.* One cow fed three days with turnips, potatoes, and straw, varied in the other three, by giving cabbage, or chaff. One cow and heifer fed with turnips, carrot tops, and straw, occasionally omitting the carrot tops, and giving potatoes.

*Remark.*—From this time until May-day, your cows must be fed in the house, or straw yard, upon good food, and plenty of it, such as turnips, carrots, mangel wurzel, and a little clean straw. Reserve your hay, if you have any, for the calving kine.

\* *Assorting Potatoes.*—Assort your potatoes very carefully—put the best aside for family use—select some about the size of a large pullet's egg for sets, which place down whole—the small and broken ones select for the pigs.

## TURNIP HARVEST: WHEAT AFTER TURNIPS: LIME:

*Turnip Harvest.*—Secure your turnip crop without delay. Do not cut the tops off quite close to the bulb, and, if any, very little of the root, they will keep all the better. You will soon find the need of heavy stores of turnips, some you may stow away in sheds and empty rooms, the remainder in ten bushel heaps, made in a round form upon the ground, rising up to a point. Lay over them a little straw, or litter of some sort or other, about three inches thick, and then earth upon that to a depth of five or six inches. These heaps may remain till wanted for use, and if, in the spring, you find the roots sprouting, open the remaining heaps, and expose them to the sun and wind.

## WHEAT AFTER TURNIPS.

Sow, drill, or dibble wheat as before directed, using a little more seed if the removal of the turnip crop is late. On light land always let your seed be well buried; for, it will be less the prey of birds, less in danger from the frost, and by rooting more and deeper before it rises above the surface, the stalks will obtain greater nourishment for the ears, and the corn be more plump, while the stems will resist the wind and weather better, and stand more erect. In wet stiff soil, however, it is not requisite to deposit the seed more than *two inches* deep, in dry, *three inches* will be sufficient.

“O what pleasure, to the intelligent,  
It is to know, and have perseverance.”—*Hawes.*

*Lime.*—In all soils there ought to be a proper quantity of lime—there may be so much, that more will do no good—there may be far too little, and it is a nice point in husbandry, exactly to adjust the quantity of it to the wants of the several crops. It appears to act as a kind of flux to certain earthy substances, and to fit them to become, along with itself, a part of the structure of plants. A proper supply of it, therefore, ought to be kept up in the soil; the best mode of doing which, perhaps, is by using it, in small quantities and frequently, as a compost. No rubbish about the farm can come amiss to form with it such compost, peat earth, poor mould, scouring of ditches, will all be found of value. Such a dressing may be requisite for your wheat crop, to increase the strength of its straw, and to keep the plants erect. In general it is applied previous to the sowing, and worked well into the ground, but kept near the surface. About four tons of lime is considered a fair dressing, without manure, for an acre of summer fallow, and half that quantity for a manured potatoe crop, followed by wheat; but if used in the caustic or quick state in any case, never let it come near to manure, particularly the fluid manure of the farm yard.



## November.

*Week commencing Monday, November the 6th, 1843.*

### Sussex.

**MONDAY**—*Willingdon School.* Boys digging for wheat. *Eastdean School.* Sixteen boys, weather being wet, were platting straw, for making hats, and thrashing wheat over a barrel. *Piper.* Digging up potatoes. *Dumbrell.* Rainy day, no report.

**TUESDAY**—*Willingdon School.* Wet day, boys in school. *Eastdean School.* Wet day, platting for hats, thrashing wheat, or in school. *Piper.* No report. *Dumbrell.* Wet, digging a few potatoes.

**WEDNESDAY**—*Willingdon School.* Boys digging for wheat. *Eastdean School.* Boys digging for, and sowing wheat, or pulling carrots, *one of them 6lbs. in weight.* *Piper.* No report. *Dumbrell.* Digging up carrots and potatoes.

**THURSDAY**—*Willingdon School.* Boys carrying out manure for wheat. *Eastdean School.* Boys emptying tank, pulling carrots, and storing them. *Piper.* Spreading dung on his grass land. *Dumbrell.* Digging up carrots, and potatoes, heifer carrying dung and potatoes.

**FRIDAY**—*Willingdon School.* Boys carrying out manure for wheat. *Eastdean School.* Boys drawing manure for wheat, digging, sowing wheat, and picking stones. *Piper.* Pulling carrots, turnips, and mangel wurzel, and storing them. *Dumbrell.* Rainy day, no report.

**SATURDAY**—*Willingdon School.* Boys digging for wheat. *Eastdean School.* Taking in a wheat rick, emptying portable pails, pigstyes,\* and cleaning school. *Piper.* Raking up rubbish near the house, and clearing away leaves. *Dumbrell.* Burying potatoes, drilling wheat, heifer carrying dung, and potatoes.

### COW-FEEDING.

*Willingdon School.* Cows fed on white turnips, and chaff.

*Dumbrell's.* One cow fed with carrot tops and straw for one day; with turnips, mangel wurzel, and straw for two days; with turnips, carrot tops, and straw for four days. Cow and heifer fed all the week on turnips, carrot tops, and straw.

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\* *Manure in abundance.*—Have your piggery yard thatched over with straw or Mc. NEIL & Co's patent felt cloth, and open at the sides; let the bottom of it be capable of holding rubbish, bring a supply of poor mould, stable clods, or weeds, and place it there; let the pigs tramp it continually, and when increased gradually to three or four loads, remove and compost it into a heap, and you will find that you will become possessed of manure almost before you are aware of it. "Let your pigs lie well, and don't be afraid of getting too much manure."—*Piper.*

### GYP SUM : VARIOUS LABOURS.

If the chief fertilizing agency of coal ashes may be attributed to the small quantity of gypsum they contain—what good effects may not be derived by a large application of gypsum to the soil?

*Gypsum, or Plaster of Paris.*—Is used as a top-dressing, and for fixing the ammonia of decaying animal substances; it is found native, or may be prepared artificially, and is compounded of *Oil of Vitriol* and *Lime*, may be used in the calcined state, or when reduced to powder from the native rock, and may be procured through the plasterer, the price of it varies from 2s. to 3s. per cwt., according to the distance from the market.

*Gypsum top-dressing.*—In using gypsum, which ought to be applied to every variety of *pod* plants, from lucerne to the bean tribe, let it be scattered upon the moist plants, so that it may be partly absorbed by their leaves, it is found in their substance, and, therefore, must be necessary for them. But because it may appear to you a poor tasteless thing, do not assume a conceit that it is inert and without value. It contains, mild as it may seem, nearly half its weight of the strongest *oil of vitriol*—which, when such gypsum is put into the ground, is gradually let loose, and seizing the ammonia it finds in the soil, converts it into a rich mess of food for plants; while the lime, its other component part, is left behind to ameliorate the soil. Never be afraid of using a little gypsum, then, either as a top-dressing for herbage, or mixed with manure, it will not be lost, but act a most important part in fertilization.

“Agriculture is the nurse of society, and the parent of every art; and the volume of science will not be unfolded to a complete and practical end, until the fields have been made to yield full and regular supply of food for all our wants.”—*Anon.*

*Various Labours.*—The unsettled weather, you may now expect, will often interrupt your out-door labours, still, there are many things for you to attend to, and whenever the weather will permit, you ought to take advantage of the opportunity. There may be ditches to clean, hedges to cut, water-furrowing to look after, or the digging for, and sowing winter wheat may not be completed. The collection of mould, from every possible source, must at no time be neglected; and every day's diligence may be requisite in trenching old pasture, or other land. Do not hesitate one moment to engage in such occupations, from a fear that the expense will not be repaid; for you may rest assured that, if skilfully managed, there is no portion of the expenditure of a farm, affording a surer prospect of profit. But above all, commence the thorough draining of your cold, wet, sour land; without this be done, you may make use of the spade or plough, the roller and harrow, or apply manure, and spend your strength in vain; for your seeds, in part, will die, and the crops rise poor and thin, become sickly, appear half starved, and ripen late.

## November.

*Week commencing Monday, November the 13th, 1843.*

### Sussex.

**MONDAY**—*Willingdon School*. Boys sowing wheat. *Eastdean School*. Sixteen boys digging for wheat, sowing wheat, and pulling carrots. *Piper*. Finished potatoe getting; had 300 bushels from three-quarters of an acre. *Dumbrell*. Drilling wheat, carrying potatoes, and turnips, with the heifer.

**TUESDAY**—*Willingdon School*. Boys digging up potatoes. *Eastdean School*. Boys digging up mangel wurzel, topping it for the cows, gathering stones. *Piper*. Sowing wheat, and carrying manure to potatoe ground, intended for wheat. *Dumbrell*. Clearing turnip ground, digging up potatoes, burying carrots.

**WEDNESDAY**—*Willingdon School*. Boys digging up potatoes. *Eastdean School*. Boys emptying tank, drawing manure for, and sowing wheat. *Piper*. Sowing wheat. *Dumbrell*. Digging up carrots, potatoes, and burying carrots.

**THURSDAY**—*Willingdon School*. Boys digging up potatoes. *Eastdean School*. Boys digging for wheat crop, sowing tares, and treading wheat. *Piper*. Spreading dung. *Dumbrell*. Digging up potatoes, heifer carrying them, and dung.

**FRIDAY**—*Willingdon School*. Digging up potatoes. *Eastdean School*. Bringing potatoes home, and gathering the haulm. *Piper*. Spreading dung. *Dumbrell*. Digging up potatoes, manuring with the heifer.

**SATURDAY**—*Willingdon School*. Boys carrying manure to the potatoe ground, intended for wheat. *Eastdean School*. Boys cleaning school-room, tank, &c. &c. *Piper*. Finished wheat sowing. *Dumbrell*. Digging, and manuring with the heifer.

### Wiltshire.

#### *Operations during the Week.*

*Slaithwaite School*. Boys, under C. Hoyle, &c., digging, spreading ashes, sowing rye, and tares, harrowing, and gathering stones. *John Bamford*. Digging. *James Bamford*. Digging up oat stubble.

#### COW-FEEDING.

*Willingdon School*. Cows fed on white turnips, and chaff.

*Piper's*. On swede turnips, and straw.

*Dumbrell's*. One cow fed in the stall, with turnips, mangel wurzel, and straw the whole week. One cow and heifer fed in the stall for four days, with carrot tops, and straw; for two days, with turnips, carrot tops, and straw.

*Small Model Farms, and an Industrial School Farm, having been established at Slaithwaite, under the auspices of the Earl of Dartmouth, the reports from them will occasionally follow. These evidently prove, that the mode of conveying agricultural information from distant places, adopted by F. Thynne, Esq., his lordship's agent, has been quite effectual. Another Industrial School is nearly complete, in the upper part of the Chapelry, where land has been given by the noble lord for the site, and also for a Farm of Industry; the design being warmly supported by the Council of Education. These important and humane improvements are under the unceasing, the untiring care of the Rev. C. A. Hulbert, and an intelligent committee. The union of the labours of the loom and the spade in a district teeming with population will, thus, be promoted. By the curious reader, the consecutive operations in these reports will be viewed with interest, as enabling him to compare the climate, and agricultural value, of the South, with the North of England.*

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#### THOROUGH DRAINING.

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"Manure may be applied in abundance, but without effect unless drainage has made the soil permeable by admitting the air, moisture, and rain."—*Dr. Buckland.*

*Thorough Draining.*—The best time to drain land is generally in November, and it is easiest done, while the land is still in grass, but about to be taken up for corn. Let the drains descend parallel to each other from the highest to the lowest part of the field, and there join a cross drain as a leader, falling to the lowest point, and of size sufficient to carry off the whole of the water from the wet soil. The parallel drains ought to be about fifteen feet distant from each other and never less than *thirty inches deep*, tapering downwards from sixteen to a few inches. In forming them, plough four deep furrows down the line of each drain, turning the two outside furrow slices over upon the grass, and the two inner slices into their places, thus leaving in the middle a broad open furrow; again let the plough pass close by one side of this furrow and return close to the other, heaping up the moved earth in the middle—which shovel out—and repeat the ploughing, and shovelling out, as often as you can. Then open the drain by the spade and pick, in the usual manner, so as exactly to receive at its bottom a drain tile or pipe; or to about five inches, to admit of stone settings, which will do equally well. In this case, pave the bottom with the more thin and flat stones, and rear firmly a row of them close to one side, and a row leaning over from the other to prop them, backed behind with rougher stones, leaving good water way between the rows. Fill up the drain above the tiles or settings, within fifteen inches of the top, with smaller stones, break the upper part small, and cover them with sods, turf downwards, which tramp down well, and place over the sods a few inches of the clay subsoil.

## November.

*Week commencing Monday, November the 20th, 1843.*

### Sussex.

**MONDAY**—*Willingdon School*. Boys digging up white carrots. *Eastdean School*. Fourteen boys digging up, cleaning, and topping mangel wurzel, and storing them. *Piper*. Pulling swede turnips. *Dumbrell*. Digging for wheat.

**TUESDAY**—*Willingdon School*. Boys digging for wheat. *Eastdean School*. Boys digging for, and sowing wheat, gathering weeds and stones. *Piper*. Digging barley stubble. *Dumbrell*. Digging for wheat, sowed nine gallons on 60 rods, or 1815 square yards.

**WEDNESDAY**—*Willingdon School*. Boys digging for wheat. *Eastdean School*. Boys emptying the tanks, treading the wheat ground. *Piper*. Wet weather, no report. *Dumbrell*. Digging, picking weeds off the wheat, heifer carrying dung.

**THURSDAY**—*Willingdon School*. Boys pulling swedes, and digging for wheat. *Eastdean School*. Boys thrashing wheat over a barrel, and plattung straw for hats. *Piper*. It being wet, nothing was done. *Dumbrell*. Digging, heifer carrying dung.

**FRIDAY**—*Willingdon School*. Wet weather, boys in school all day. *Eastdean School*. Boys turning dung and mould, digging for, and sowing wheat, and topping turnips. *Piper*. Wet, digging barley stubble. *Dumbrell*. Digging, drilling wheat, heifer carrying dung, and potatoes.

**SATURDAY**—*Willingdon School*. Very wet, boys in school all day. *Eastdean School*. Wet day, clearing up wheat, and cleaning school. *Piper*. Wet day, no report. *Dumbrell*. Rainy day, no report.

### Portsmouth.

#### *Operations during the Week.*

*Slaithwaite School*. Twenty-one boys harrowing on Wednesday, fifteen occasionally gathering stones, collecting manure, &c. *James Bamford*. Digging oat stubble.

#### COW-FEEDING.

*Willingdon School*. Cows fed on white turnips, and the tops of swede turnips.

*Dumbrell's*. One cow stall-fed for four days, with turnips, mangel wurzel, and straw; and two days with turnips, mangel wurzel, potatoes, and straw. One cow and heifer stall-fed with turnips, and straw during the week.

## RIDGE FALLOWING, &c.: TRENCHING GROUND FOR POTATOES, &c.

*Ridge Fallowing and Subsoil Trenching.*—After thorough draining, in preparing for a turnip crop, use the plough and fork in subsoiling, as follows:—Immediately after the corn is secured, plough the stubble lightly, harrow well, gather the clods and stubble into several heaps in the field, and compost them with manure. Plough a second time as deep as you can—use the scuffle—harrow well, and ridge up as for turnip sowing—a single frost will mellow the rough slags of these ridges—after which, as soon as weather will permit—beginning at one end of the ridge proceed to the other—forking it over, and stirring the soil under it as deep as possible—at the same time stir the bottom of the furrow, and let your fork go deep—and gathering the weeds, roots, &c. as you go on, place them upon the moved subsoil in the furrow. After this the frosts of winter will mellow the ridged soil and produce a beautiful tilth. In May following spread manure in the furrows, over the weeds and roots, split the ridges with the plough or hack—cover the manure—and sow swedes. In practice, the writer finds this plan to answer admirably, it is the least expensive method of preparing a turnip fallow, and always a sure one.

“The Field Garden ought to be the working man's Savings' Bank. And the artisan, untired with other labour, will find health, recreation, and profit in its cultivation.”

*Trenching Ground for Potatoes.*—Every season brings its particular employment, and trenching ground ought always to be done, and at every spare interval of time previous to the frosts of winter. In trenching grass land for potatoes, remove the sod by the *paring spade*, but let the parings remain as a covering to protect the ground underneath from sudden frosts, putting them a little aside as the trenching advances, after which proceed as follows:—

In one corner of the plot, dig up a moderately broad, but very deep slice and 18 inches long, at two cuttings, which reserve by placing them to the left, turn over a similar slice divided in two into the space it occupied, and form a continuous row of such slices close to the right hand side of the plot, from one end to the other, each one in succession being divided and falling over into the space left vacant. The last vacancy at the end of the row must then be supplied with the clods reserved at the beginning; and underneath each slice, as you go on, let the subsoil be thoroughly moved with the spade, but not much displaced.

Alongside of this row or series of slicings, and from end to end, open a channel down to the subsoil, by digging slices and piling them into a high ridge upon the first row; to accomplish which give the spade a cast to the right hand, turning over these slices and heaping them into a high ridge; let this channel or furrow be 18 inches broad, and stir the subsoil deeply as before; complete

## November.

*Week commencing Monday, November the 27th, 1843.*

### Sussex.

**MONDAY**—*Willingdon School*. Boys digging for wheat, after swede turnips. *Eastdean School*. Seventeen boys digging and topping mangel wurzel, and carrying the tops and the gathered weeds to the pigs. *Piper*. Pulling swede turnips. *Dumbrell*. Drilling wheat, carrying dung and potatoes with the heifer, one load of each a mile.

**TUESDAY**—*Willingdon School*. Boys digging as before. *Eastdean School*. Boys digging mangel wurzel ground, sowing it with tares, for seed, hoeing cabbages, and picking stones. *Piper*. Digging ground where the swedes grew, for exposure to air and frost. *Dumbrell*. Drilling wheat, heifer carrying dung and potatoes, each a mile.

**WEDNESDAY**—*Willingdon School*. Boys digging for wheat, after swedes. *Eastdean School*. Boys digging up potatoes, picking haulm, emptying tanks, and cleaning pigstye. *Piper*. Pulling mangel wurzel. *Dumbrell*. Drilling wheat, heifer carrying dung.

**THURSDAY**—*Willingdon School*. Digging for wheat, after swedes. *Eastdean School*. Boys getting swede turnips, digging for, and sowing wheat, and treading it. *Piper*. Spreading manure. *Dumbrell*. Drilling wheat, collecting street scrapings, applied 100 gallons of tank liquid, to four rods of Italian rye grass.

**FRIDAY**—*Willingdon School*. Boys pulling swedes. *Eastdean School*. Boys digging wheat stubble, gathering stubble, treading new sown wheat, and planting cabbages. *Piper*. Spreading manure. *Dumbrell*. Drilling wheat, heifer carrying dung.

**SATURDAY**—*Willingdon School*. Boys sowing wheat. *Eastdean School*. Boys emptying privy pails and tank, cleaning school, and getting cow fodder for Sunday. *Piper*. Cleaning out the piggery. *Dumbrell*. Drilling wheat, heifer carried 18 loads of dung out, applied 36 gallons of liquid to two rods of rye.

### Wiltshire.

#### *Operations during the Week.*

*Slaithwaite School*. No report. *John Bamford*. Getting swede turnips, storing them, and thrashing spring wheat, and oats.

#### COW-FEEDING.

*Willingdon School*. Cows fed on swede turnip tops, and straw.

*Dumbrell's*. One cow stall-fed during the week, on turnips, potatoes, mangel wurzel, and straw. One cow stall-fed during the week, on turnips, and straw.

### TRENCHING FOR TURNIPS : DIGGING STUBBLE : HOMESTEAD RUBBISH.

another ridge in a similar manner, and when done, place the sods that before covered the area so trenched, turf inwards, upon the moved subsoil in the furrow, between the two ridges so formed, and proceed with the remainder of the plot as before described. The rows of potatoes will thus be one yard distant, and the frosty weather will greatly assist in breaking down the ridges, mellowing the soil into tilth the most perfect, and in killing the vermin.

*Trenching old pasture for Turnips, &c.*—A crop of potatoes is probably the best you can take on breaking up old pastures, but if you desire to have a crop of turnips, let the trenching be performed exactly the same as above described, except in the adjusting of the length of the ridge slices and width of the furrow, so that the rows may be from 20 to 27 inches apart. The turf sod in such a case ought to be burned and the ashes scattered into the intervening furrows; after a frost or two the ridges may be combed with a rake or hoe, in order that the burnt ashes may be lightly covered with the earth that will fall down during the operation. You may thus secure a luxuriant crop of turnips, with much less manure, and probably avoid having it ravaged with the *wire worm*.

"To do a little *constantly*, and to do that little *well*, has long been the profitable maxim of the Flemings."

*Stubble Digging.*—Before winter dig up all your stubbles with spade, or fork, or turn them over with the plough; and every succeeding year let these instruments go somewhat deeper into the ground. Half an hour's labour at a time will accomplish a great deal in the end; and remember that by frequent digging, gradual deepening, and manuring, you may convert the most barren soil into a most productive one. Throw up your clods large, rear them high, that they may receive the mellowing influence of the frost, of air, and light;—accomplish your task before frost visits you, and lead away from the plot all superfluous water in open furrows.

"Prepare thy work without, and make it fit for thyself in the field."—  
Prov. xxiv. 27.

*Homestead rubbish.*—Now gather up every kind of rubbish, potatoe haulm, &c, and throw it to your pigs; let it be well tramped by them, and in this state spread it upon the grass, where it may remain till March, then clear off the stalks, and all that is left of the dung, for your compost heap; you will be abundantly rewarded for your trouble. Amongst other things, when the weather is moist, you may begin to apply the contents of your tank to the grass intended to be mown, or your small plot of young clover; but never apply it to the fields that have been pastured upon, or tramped over



## December.

*Week commencing Monday, December the 4th, 1843.*

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### Sussex.

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**MONDAY**—*Willingdon School*. Boys pulling swede turnips. *Eastdean School*. Digging up oat stubble, hoeing weeds off, and picking stubble for the compost heap. *Piper*. Digging up wheat stubble. *Dumbrell*. Drilling wheat, harrowing, heifer carrying potatoes.

**TUESDAY**—*Willingdon School*. Boys pulling swede turnips. *Eastdean School*. Boys digging up mangel wurzel, bringing tops to the pigs and cows, picking stones. *Piper*. Digging wheat stubble. *Dumbrell*. Digging wheat stubble, spreading dung, heifer carrying it for me.

**WEDNESDAY**—*Willingdon School*. Boys digging for wheat, after swede turnips. *Eastdean School*. Boys digging for, and sowing tares, picking stones, and emptying tank. *Piper*. Spreading tank liquid on grass land. *Dumbrell*. Digging, spreading dung, drilling wheat, heifer carrying dung.

**THURSDAY**—*Willingdon School*. Boys digging for wheat, after swedes. *Eastdean School*. Wet, boys thrashing wheat over a barrel, and platting straw for hats. *Piper*. Digging up stubble. *Dumbrell*. Rainy day, no report.

**FRIDAY**—*Willingdon School*. Boys digging for wheat, after swedes. *Eastdean School*. Boys gathering mangel wurzel, and storing roots, picking stones. *Piper*. Digging between lucerne drills. *Dumbrell*. Heifer carried 14 loads of dung, spreading it.

**SATURDAY**—*Willingdon School*. Boys sowing wheat. *Eastdean School*. Boys getting turnips for sowing wheat, emptying privy pails, cleaning school, and about the buildings. *Piper*. Digging between lucerne drills. *Dumbrell*. Spreading dung, drilling wheat and harrowing.

### Worckshire.

#### *Operations during the Week.*

*Slaitthwaite School*. No report. *James Bamford*. Digging up oat stubble. *Christopher Varley*. Clearing ground for wheat, leading lime for it, spreading, and sowing broadcast; the unfavourable weather prevents the drilling of it. Digging up oat stubble for tares and turnips next year. *John Bamford*. Hoeing, manuring, and planting cabbages, finished his early Yorks on Friday. On Saturday, a boy was pricking out Scotch cabbages.

## COW-FEEDING.

"Now shepherds to your helpless charge be kind,  
Battle the raging year, and fill their peeps  
With food at will."—*Thomson.*

*Willington School.* Cows fed on swede turnip tops, and barley straw.

*Piper's.* Fed on a bushel of swedes, and straw. One cow produces him about 3lbs. of butter a week, and will calve the 20th of next February.

*Dumbrell's.* One cow stall-fed for four days, on turnips, mangel wurzel, and straw; for two days with turnips, mangel wurzel, and straw. One cow and heifer stall-fed with turnips, and straw.

## TANK LIQUID ON GRASS: TANK LIQUID WITH GYPSUM ON CLOVER.

by cattle; the herbage there may have received far more of the precious fluid, in most places, than the plants require. Previous to the application of the liquid to the grass, it may be well to strew over it about two cwt. of gypsum per acre, unless the free ammonia of the liquid be already fixed by other chemical agents.

"The total loss, in England, of liquid manure has been estimated at seven millions annually."

*Application of Tank liquid to grass.*—You need not hesitate, at this season, to apply tank liquid, when fresh, to the grass intended for mowing next year, even if snow is upon the ground, especially if there be a prospect of a fresh fall of snow. By allowing it to ferment while in the tank, a substance is gradually formed always tending to fly off, both while it remains there, and after its application to the grass, unless retained by chemical appliances. When once within the ground, the fermentation of the fresh liquid gradually proceeds, and the roots of the plants appropriate, as food, this substance, ammonia, as fast as it is produced, without, probably, permitting much of it to escape.

"The agricultural value of the liquid manure voided by one cow, in the year, has never been computed, by practical men, at less than forty shillings, yet, in most farms it is allowed to run to waste, and to supply its place, farmers are buying guano at £10 or £12 per ton."

*Tank liquid with Gypsum on clover.*—In mild, rainy weather, you may venture to sprinkle over your small plot of clover, tank liquid diluted with water, and while the herbage is still moist, sow about two cwt. of fine-pounded gypsum. A few days afterwards it ought to be well tramped, or rolled with a very heavy roller, so that the coming frost may have less power to heave the young clover plants from the ground. From the observations of the Rev. W. THORPE,

## December.

*Week commencing Monday, December the 11th, 1843.*

### Sussex.

**MONDAY**—*Willingdon School*. Boys digging for wheat, after swedes. *Eastdean School*. Fifteen boys digging oat stubble, treading wheat, or picking stones. *Piper*. Cleaning lucerne, and mending it. *Dumbrell*. Pulling, tipping, and topping turnips.

**TUESDAY**—*Willingdon School*. Boys carrying manure to the clover ground, for wheat. *Eastdean School*. Boys digging oat stubble, picking weeds, getting, and storing turnips. *Piper*. Cleaning pigs out, and making their manure into a mixen. *Dumbrell*. Drilling wheat, pulling, tipping, and topping turnips, mixing dung and mould.

**WEDNESDAY**—*Willingdon School*. Boys digging clover ley, for wheat. *Eastdean School*. Boys emptying tank, digging, drawing dung from pigstye and cowsheds. *Piper*. Digging wheat stubble. *Dumbrell*. Pulling, tipping, and topping turnips, drilling wheat, heifer carrying chalk.

**THURSDAY**—*Willingdon School*. Boys digging clover ley, for wheat. *Eastdean School*. Boys getting mangel wurzel, cleaning and topping it for the cows. *Piper*. Digging up mangel wurzel ground. *Dumbrell*. Pulling, tipping, and topping turnips, heifer carried 23 loads, of six bushels each.

**FRIDAY**—*Willingdon School*. Boys digging clover ley, for wheat. *Eastdean School*. Boys digging for tares, sowing them, picking weeds, or sorting potatoes for the pigs. *Piper*. Spreading dung on grass land. *Dumbrell*. Drilling wheat, covering potatoe lumps with potatoe haulm, and stubble.

**SATURDAY**—*Willingdon School*. Digging clover ley, and sowing wheat. *Eastdean School*. Boys cleaning out pigstye, privy pails, cleaning school, and getting cow fodder for to-morrow. *Piper*. Digging wheat stubble. *Dumbrell*. Drilling wheat, manuring it, planting 39 turnips for seed.

### Yorkshire.

#### *Operations during the Week.*

*Slaithwaite School*. No report. *Christopher Varley*. Winnowed 4 bushels of wheat, the produce of 24 quarts sown, mixing dung and mould, gathering stones, emptying privy. *James Bamford*. Draining. *John Bamford*. Draining.

#### COW-FEEDING.

*Willingdon School*. Cows fed with white turnips and straw. *Dumbrell's*. One cow stall-fed with turnips, mangel wurzel, and straw. One cow and heifer stall-fed with turnips and straw.

## TURNIPS FOR SEEDLINGS: WITHIN-DOOR EMPLOYMENT: STEAMING APPARATUS.

it is very probable that the "clover sickness," is, in some measure, owing to the rupturing, and subsequent decomposition of the young plants, by the frosts of winter; and this plan is recommended, in the hope that it may prove a preventative of that disease.

### TURNIPS FOR SEEDLINGS.

Select a few of the *largest* turnips with the *smallest* tops, and carefully preserve them till Spring for seedlings.

"True taste is an excellent economist. She confines her choice to few objects, and delights in producing great effects by small means."—*Rogers*.

*Within-door Employment.*—You will often observe a gentleman betake himself to mechanical employments, within doors, of one kind or another. The lathe, the joiner's bench and tools, furnish him with recreation, or amusement, and to you they may yield both pleasure and profit. Learn how to use these tools and it may save you many a shilling, and enable you to keep every thing about your place nice and tidy. When a shower sends you home, resume your carpentry; and even if you have better employment, an occasional five minutes spent at the carpenter's bench will be a pleasant relaxation. Construct an *open sided Shed* to fabricate and dry composts in—repair your *farming implements*—provide without delay a *Tank Barrel*; and if you are unable to procure one like that whose description follows, fix a good sized beer barrel upon a wooden axle, crossing a strong forked stick, and mount it upon a couple of home made wheels, two feet in diameter, so that it may be drawn by hand into the field; or attach slender shafts, that your ass may be yoked thereto; furnish the barrel with a trough, pierced full of holes; place it behind to receive the liquid, and to cause its equal distribution upon the land.

*Steaming Apparatus.*—If you can accomplish the construction of a steaming apparatus, it will be found of the greatest use; and perhaps by using a little ingenuity, and without much expense, you may have your kitchen fire in part surrounded with a closed boiler, wherein a continual supply of steam will always be ready, for culinary purposes and root steaming; good turnips and straw, or refuse hay, rape stalks, all chopped up fine, well steamed, and incorporated together into a mash, with a little bean or oat meal, is a luxury to cattle in general, and of which they seldom grow tired.

## December.

*Week commencing Monday, December the 18th, 1843.*

### Sussex.

- MONDAY**—*Willingdon School*. Boys digging clover ley, for wheat. *Eastdean School*. Boys digging oat stubble, getting and storing turnips, and gathering leaves. *Piper*. Digging up wheat stubble. *Dumbrell*. Spreading dung, drilling wheat, and harrowing.
- TUESDAY**—*Willingdon School*. Boys digging clover ley, for wheat. *Eastdean School*. Boys getting, topping, and storing mangel wurzel. *Piper*. Drawing mould to the mixen. *Dumbrell*. Digging for, and drilling wheat.
- WEDNESDAY**—*Willingdon School*. Boys digging clover ley, for wheat. *Eastdean School*. Boys drawing drills for wheat, to have the liquid put in, picking stones and roots. *Piper*. The same as yesterday. *Dumbrell*. Digging, drilling wheat, harrowing.
- THURSDAY**—*Willingdon School*. Boys digging clover ley, for wheat. *Eastdean School*. Boys digging mangel wurzel ground, treading wheat, gathering and topping turnips. *Piper*. Mixing dung and mould together. *Dumbrell*. Digging, drilling wheat, and harrowing.
- FRIDAY**—*Willingdon School*. Boys finished wheat sowing. *Eastdean School*. Boys thrashing wheat over a barrel, platting straw for hats, tying the straw in bundles. *Piper*. Mixing dung and mould together. *Dumbrell*. Digging, and drilling wheat.
- SATURDAY**—*Willingdon School*. Boys cleaning out the tanks. *Eastdean School*. Boys emptying the portable pails, cleaning pigstye, and school room, and getting cow fodder for the morrow. *Piper*. Digging wheat stubble.

### Yorkshire.

#### *Operations during the Week.*

- Slaithwaite School*. No report. *C. Varley*. Digging for spring tares, after oats, and for potatoes. *James Bamford*. Draining, assisted by four manufacturing workmen and a horse.

#### COW-FEEDING.

- Willingdon School*. Cows fed on turnips and barley straw. *Piper's*. Admonishes us to give hay on Christmas-day as their plumb cake.
- Dumbrell's*. One cow fed during the week on turnips, mangel wurzel, and straw. One cow and heifer stall-fed during the week, with turnips, turnip tops, and straw.

*Warmth and Food*.—Keep your cows well, and warm, for the better you keep them, the better will they make your land, and the less food they will require.

# BELGIAN TANK BARREL: QUANTITY OF TANK LIQUID PER ACRE: TEST OF AMMONIA.

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"In instruments intended for general use a great recommendation is simplicity of construction."

*Belgian Tank Barrel.*—The Belgian tank barrel is mounted upon three wheels, two at the sides, one before, and so arranged that the three wheels may pass down three furrows. They may be formed of wood alone, or hooped with an iron tire, four and a-half inches broad. The barrel is so connected with the shafts and axle, that it may be tilted up a few inches. A hole is bored, perpendicularly, through both sides of the barrel, and close to the hinder end of it, so that a long stick may pass through the barrel, from the upper hole, and one extremity be made to act as a plug, to the inferior hole. A splash board, about a foot square, is placed at a distance of about a foot, immediately under the hole. The attendant pulls up this long plug, or replaces it in the hole when requisite. The fluid then issuing through the aperture, on its striking the board, is made to rebound on all sides, to a distance of five or six feet, and as the quantity of the effluent liquid diminishes, the barrel is tilted upwards to increase its velocity.

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*Quantity of Tank Liquid per Acre.*—M. SPRENGEL recommends the application of 4000 or 5000 gallons of real liquid manure to an acre of grass, but from experience, I find a much less quantity sufficient to produce excellent effects. About 3000 gallons per acre, much diluted with water are applied, during winter, to mowing grass, following after a good dressing of farm yard manure containing much mould, and applied in the fall of the year preceding, and the increase of crop is remarkable: but, decidedly greatest when the fixation of the ammonia has been effected by chemical agents.

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"The chief art of agriculture depends upon the collection and preservation of those manures which contain ammonia."—*Liebig*.

*Test of Ammonia.*—The pungent odour, which is emitted from the common smelling bottle, is familiar to most persons, and when once known is not easily forgotten. It is that of ammonia. But for ascertaining the presence of this attenuate and volatile substance, we possess a test of greater delicacy than the smell, whereby its emission and escape from any source may be detected. Expose a slip of wood moistened with muriatic acid, *spirits of salt*, near the materials that, during fermentation, emit it in the gaseous state, such as decaying animal matter, tank liquid, farm yard manure, &c., and the ammonia, on its escape, coming in contact with the acid, will unite with it, and form a dense white vapour, consisting of minute particles of saline matter, the sal-ammoniac of commerce floating in the atmosphere.

## December.

*Week commencing Monday, December the 25th, 1843.*

### Sussex.

**MONDAY**—*Willingdon School*. Boys holiday during the week. *Eastdean School*. Boys holiday during the week. *Piper*. Christmas day, holiday. *Dumbrell*. Christmas day, holiday.

**TUESDAY**—*Piper*. Holiday. Measured the potatoes which grew upon the down, and find I have 720 bushels, from what was called worthless land, where people could not reap as much seed as they sowed. *Dumbrell*. Digging, drilling wheat, and pulling turnips.

**WEDNESDAY**—*Piper*. Keeps holiday. *Dumbrell*. Drilling, and digging wheat stubble.\*

**THURSDAY**—*Piper*. Digging wheat stubble. *Dumbrell*. Digging, and drilling wheat, and harrowing.

**FRIDAY**—*Piper*. Digging wheat stubble. *Dumbrell*. Digging, and drilling wheat, and harrowing.

**SATURDAY**—*Piper*. Getting mould along side the hedge rows. *Dumbrell*. Digging, heifer carried one load of dung.

### Woreshire.

#### *Operations during the Week.*

*Slaithwaite School*. No report. *C. Varley*. Digging and gathering stones. *James Bamford*. Draining. *John Bamford*. Draining.†

#### COW-FEEDING.

*Piper's*. As usual, with hay for plumb-cake on Christmas day.

*Dumbrell's*. One cow stall fed with turnips, mangel wurzel, and straw. One cow and heifer fed with turnips and straw during the week.

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\* *Exhausted Wheat Stubble*.—Now is the time for breaking up your wheat stubble, and if it wants manure, to mend it for a following turnip crop. Seek every where for a supply of manure, and after all, you will not have more than enough in the spring.

† *Employment of the Poor*.—The draining of these small farms at Slaithwaite was done at the expense of their noble landlord; and *Bamford* adds, with considerable feeling, in a note, "that nothing but the purest benevolence could have dictated so timely an interference to assist the operative unemployed manufacturers, and it was gratifying to observe the pride with which the men entered upon their labours, and to hear their affectionate expressions towards the noble and good Earl, their patron and employer on the present occasion, when the change of modes, or improvements in manufacturing facilities, had left them in the rear, cast off, to shift for themselves as they best could, and without other resource than the parish."

## FIXATION OF AMMONIA: VITRIOLATED TANK LIQUID: FINAL LABOURS OF THE YEAR.

"Whoever fails, says M. SPRENGEL, to employ water or some neutralizing substance to combine with the ammonia, which is produced in so great a degree in summer, suffers a loss of manure which exceeds all belief. It is a gaseous substance, and not a solid material visible to the naked eye, which thus escapes and is lost; but for all that, it is of greater importance to the nourishment of plants, than perhaps any other portion of the excrements."

**Fixation of Ammonia.**—In stables and privies, as also upon the mixen, frequently scatter *gypsum* in fine powder, or saw dust well moistened with *chloride of calcium* dissolved in water, or with either *sulphuric* or *muriatic* acid, diluted with ten times its bulk of water. Let water be added to tank liquid in moderate quantity, and the ammonia formed there will be less speedily dispersed; and add one or other of the above chemical agents, when ammonia is found escaping as such tank liquid ferments.

**Vitriolated Tank liquid.**—Add about 14lbs. of oil of vitriol, value 1s. 2d., to 400 or 500 gallons of moderately stale tank liquid, stir them well together. By this addition, a combination will be effected between the oil of vitriol and the ammonia contained in the liquid, sulphate of ammonia, *gas salt*, a fixed and stable compound, being formed and remaining in solution, which in the dry form would sell for more than the oil of vitriol added thereto. The acid will disappear, and nothing of a corrosive nature will remain in the fluid, quite the contrary; for apply the mixture as a top dressing, to one-third of an acre of either grass intended for mowing, or winter wheat, and probably its increased growth in the spring, may be such as to give you a very agreeable surprize.

**Observation.**—My tank holds about 500 gallons, and receives the urine of six cows and three horses, as well as the rain which percolates through a mixen exposing a surface of 36 square yards. It is generally filled in about 14 days, and the contents require for saturation from 15 to 20lbs of Oil of Vitriol, and more than that weight of *Spirits of Salts*: the exact point of saturation is easily attained by gradually adding acid, until paper tinged yellow with tumeric, when dipped into the fluid, does not become brown in colour.

"Let us enumerate some of the chief 'pointes of good husbandrie'. Thorough draining—good sub-soiling—good tillage—gradual deepening of the soil—improving its composition—proper collection and application of manures—economical application of farm produce."—*Common Sense*.

**Final labours of the year.**—The principal labours in the field being nearly accomplished, turn now your attention to labours at home, but avail yourself of an occasional hard frost, and do not lose the opportunity of improving the texture and composition of your soils, by carting over the frost bound land such materials as may be requisite for this purpose. Should a particular part of the farm require *clay*, supply it by transference from another field, or from another site. If *sand*, supply it with sand, with coal-ashes, or sand-



## January.

*Week commencing Monday, January the 1st, 1844.*

### Sussex.

**MONDAY**—*Willingdon School*. Boys digging wheat stubble. *Eastdean School*. Fourteen boys digging stubble, gathering and topping turnips. *Piper*. Rubbing out carrot seed.\* *Dumbrell*. Rain and snow, repairing buildings.

**TUESDAY**—*Willingdon School*. Boys digging as before. *Eastdean School*. Boys digging, and treading wheat, picking stones, and breaking clods. *Piper*. Rubbing out carrot seed. *Dumbrell*. Snow on the ground, repairing road to the fields.

**WEDNESDAY**—*Willingdon School*. Boys digging wheat stubble. *Eastdean School*. Boys digging, emptying tank, picking out weeds for the pigs. *Piper*. Cleaning out the piggery. *Dumbrell*. Mending the road with chalk.

**THURSDAY**—*Willingdon School*. Boys digging. *Eastdean School*. Boys thrashing wheat over a barrel, platting straw for hats, and at their multiplication table. *Piper*. Drawing mould to dung mixen. *Dumbrell*. Digging, and pulling up turnips.

**FRIDAY**—*Willingdon School*. Boys digging wheat stubble. *Eastdean School*. Boys digging for peas, picking up mangel wurzel leaves and small potatoes for the pigs. *Piper*. Cleaning piggery, and putting mould in the pound instead of litter. *Dumbrell*. Digging.

**SATURDAY**—*Willingdon School*. Boys digging stubble. *Eastdean School*. Boys emptying cow tank, portable pails, cleaning pigs, and school. *Piper*. Drawing pigs' manure to the mixen. *Dumbrell*. Digging.

### Wiltshire.

#### *Operations during the Week.*

*Slaithwaite School*. No report. *John Bamford*. Removing clay from the drains, digging. *C. Varley*. Frost and snow, emptying the tank on the wheat, digging for potatoes. *Taylor*. Paring ground. *James Bamford*. Carting manure, draining and digging, when the weather permitted.

#### COW-FEEDING.

*Willingdon School*. Cows fed once a day with white, and once with swede turnips, and straw.

*Dumbrell's*. One cow stall fed with turnips, mangel wurzel, and straw. One cow and heifer fed with turnips, and straw.

\* *Carrot Seed*.—To preserve it properly it must be put in a dry bag, kept in a dry room, or hung up in your kitchen. Squeeze it well into the bag, as close as hops in a poke, like them, the seed will keep all the better.

## FINAL LABOURS OF THE YEAR.

*stone road scrapings*, incorporating such materials intimately with the soil. Also do not neglect to bring under cover *earthy mould* for composting purposes—preserve *coal-ashes*, and keep them dry—and when the *cattle*—the *stail*—and other labours demand not attention, let your efforts be much directed to the preparation of *composts* and *hand tillages*, for these things will be treasures laying in store for the following year; and always remember that future *success* will greatly depend upon your present *forethought*, and the *patience* with which it is exercised,

"Many are the sayings of the wise,  
Extolling patience as the truest fortitude."—*Milton*.

## January.

## CHEMICAL TILLAGES AT HOME.

— "Serene Philosophy!  
Effusive source of evidence and truth,  
Without thee, what were unassisted man;  
A savage, roaming through the woods and wilds  
Rough clad; devoid of every liberal art,  
And elegance of life."—*Thomson*.

*Chemical Tillages at home*.—It is a very remarkable thing, that all the investigations of chemists, and the experiments of practical farmers, and some of them have been truly ingenious, would seem to point to "home" as the source of the most valuable manures.

A variety of substances have been tried, but the best fertilizers appear to be things that may be said to be always ready at hand amongst our "household stuff."—Thus, we have *rape dust* as home produce; we have *common salt* in continual use; we have *salts of ammonia*, of *potash* and of *soda*, as well as *phosphates of lime*, and *magnesia* in the urinary, and other excretions, and in a form too, best fitted for vegetation. *Sulphate* and *muriate* of *ammonia* (*sal ammoniac*) are found in coal ashes: while *potash* or its salts are found in the ashes of wood fires, as well as in the water ejected on purifying the body, or its covering, by washing with soap, or other detergents. We have abundance of *phosphate of lime*, (*bone earth*) &c., in the hair, flesh, and bones of animals. *Nitre* (or *saltpetre*) forms spontaneously around us in the soil, while we have a substance that contains all these things, a complete type of *guano*, in the *dung of domestic fowls*.

Philosophical theory leads us to the conclusion that in the things above enumerated, we may expect to find the chief fertilizing matters, and its predictions are in strict accordance with the results of experiments; evincing that in nature there are very admirable provisions for our preservation.—For it plainly appears that wherever there is life, most of the elements necessary for its existence are

## January.

*Week commencing Monday, January the 8th, 1844.*

### Sussex.

**MONDAY**—*Willingdon School*. Boys digging wheat stubble, for turnips, mangel wurzel, and carrots. *Eastdean School*. Twelve boys to school, rest at work for the farmers, digging, and gathering weeds and stones, for peas. *Piper*. Cleaning pigs out. *Dumbrell*. Digging.

**TUESDAY**—*Willingdon School*. Boys digging wheat stubble. *Eastdean School*. Boys digging for peas, clearing the roots and stones. *Piper*. The same as yesterday. *Dumbrell*. Digging.

**WEDNESDAY**—*Willingdon School*. Boys digging wheat stubble. *Eastdean School*. Boys emptying tank, and spreading contents on the land for carrots, manuring with dung, and clodding. *Piper*. Digging wheat stubble, for turnips. *Dumbrell*. Digging stubble.

**THURSDAY**—*Willingdon School*. Boys digging wheat stubble. *Eastdean School*. Boys thrashing wheat, digging stubble, and clearing away the roots. *Piper*. Drawing mould to the mixen. *Dumbrell*. Digging, heifer carrying manure.

**FRIDAY**—*Willingdon School*. Boys digging wheat stubble. *Eastdean School*. Boys digging for peas, getting and topping turnips, gathering stones. *Piper*. Digging wheat stubble. *Dumbrell*. Digging all day.

**SATURDAY**—*Willingdon School*. Boys emptying tank liquid, for spring tares, and turning mixen. *Eastdean School*. Boys cleaning up wheat, cleaning out piggery, portable pails, the school, and getting food for to-morrow. *Piper*. The same as yesterday. *Dumbrell*. Digging.

### Yorkshire.

#### *Operations during the Week.*

*Staitheite Tenants*. *Taylor*. Digging, and burying parings. *James Bamford*. Draining and digging. *John Bamford*. Digging. *C. Varley*. Digging for potatoes, mixing mould with dung, digging oat stubble, for turnips, cutting hay and straw.

#### COW-FEEDING.

*Willingdon School*. Cows fed on swede turnips, and oat straw. *Dumbrell's*. One cow stall fed with mangel wurzel, turnips, and straw. One cow and heifer fed with turnips, carrots, and straw.

## UTILITY OF SCIENCE: BONES DISSOLVED IN OIL OF VITRIOL: SOURING VESSEL.

formed in that vicinity; and that cultivation on any space, is aided more by the animal existence, upon that space, and the labours of man, properly directed, than in any other way. This constitution of things, we might expect to find in a world, where there are so many admirable adaptations. Man requires continual and uninterrupted supplies of food, and it does not appear to have been designed, that he should go far from home for things necessary to aid him in its production, but rather that his existence should be made to depend upon that of the animals near his dwelling, and his own exertions.

"In nature's infinite book of secrecy,  
A little we may read."—*Shakespeare.*

*Utility of Science.*—Science may not have been so fortunate as greatly to increase the list of fertilizers, but it has taught us how to elaborate into composts, and to imitate artificially, the natural manures. We have been instructed how to fix the volatility of some, and to reduce others to a finer state, and how to adapt all, with more precision, to the requirements of the different species of vegetables. Bones are ground to dust, in order that they may act upon our crops with greater energy; but the chemist, by employing solvents, reduces them to a state of division, greater by thousands of degrees, and thus increases their power.

The solution of bones has been applied to crops, in many instances, with great effect, and the results wonderfully accord with the predictions of science.—*See Mr. Pusey's Report.*

*Bones dissolved in Oil of Vitriol.*—Provide a tub or wooden vessel to hold 40 gallons, which place in a corner of your shed. Pour into it six gallons of water. Then add 24lbs. of *Oil of Vitriol*; and afterwards *One Bushel of Bones*, finely ground, and frequently stir them well together. After some days you will find the earthy part of the bones dissolved, and little remaining except the cartilaginous part of them, and the fat swimming upon the surface of the solution, in the form of animal oil. The solution presents a milky appearance, like *gruel*, and may be mixed with water and used as liquid manure. It may also be composted into the solid form, by mixing it with finely sifted coal-ashes, and its application in that state will, in certain seasons, be far more convenient.

"Bones may be roughly stated to consist of fat, jelly, and an earthy matter called phosphate of lime. This earthy part may be *withdrawn*, or *fetcht out*, by the action of *oil of vitriol*. The fat, the jelly, and a substance called phosphoric acid are set free, the latter having grand fertilizing properties."—*See Mr. Pusey's Report.*

*Souring Vessel.*—I adopt this name from the dyer, as being a term

## January.

*Week commencing Monday, January the 15th, 1844.*

### Sussex.

**MONDAY**—*Willingdon School*. Boys digging up stubble for potatoes, mangel wurzel, &c. *Eastdean School*. Boys digging for peas, drawing manure, gathering stones. *Piper*. Drawing mould to the mixen. *Dumbrell*. Carrying out, and spreading manure on the wheat, in a frost.

**TUESDAY**—*Willingdon School*. Boys digging up stubble. *Eastdean School*. Boys digging for peas, gathering roots, and mangel wurzel leaves. *Piper*. Drawing mould to the mixen. *Dumbrell*. Carrying out, and spreading manure upon wheat, in a frost.

**WEDNESDAY**—*Willingdon School*. Boys digging up wheat stubble. *Eastdean School*. Boys digging for peas, clod breaking, spreading tank liquid on the carrot ground. *Piper*. Drawing dung to the mixen, and mixing it well up with mould. *Dumbrell*. Manuring wheat during a frost.

**THURSDAY**—*Willingdon School*. Digging wheat stubble. *Eastdean School*. Digging for barley, sorting potatoes, treading wheat clod breaking. *Piper*. Drawing mould to the mixen. *Dumbrell*. Digging, drilling peas.

**FRIDAY**—*Willingdon School*. Digging up wheat stubble. *Eastdean School*. Boys thrashing wheat over a barrel, platting straw, and learning to make beehives. *Piper*. Cleaning out piggery, emptying tank liquid on the mixen. *Dumbrell*. Digging, drilling peas.

**SATURDAY**—*Willingdon School*. Boys digging wheat stubble. *Eastdean School*. Boys breaking up pasture land, emptying tank, portable pails, and cleaning school room. *Piper*. Taking potatoes in for the pigs. *Dumbrell*. Digging, drilling peas.

### Yorkshire.

#### *Operations during the Week.*

*Slaithwaite Tenants*. *James Bamford*. Draining. *C. Varley*. Spreading tank liquid on grass land, digging for turnips and oats, draining.

#### COW-FEEDING.

*Willingdon School*. Cows fed on swede turnips, and oat straw. *Piper's*. Swede turnips and straw for breakfast, straw for dinner, swede turnips and hay for supper.

*Dumbrell's*. One cow stall fed with turnips, mangel wurzel, and straw. One cow and heifer fed with turnips, carrots, and straw, during the week.

## HOME MADE GUANO : ARTIFICIAL GUANO.

of his art, familiar to many of you ; I apply it to the tub or vessel above-mentioned, which I hope will be placed, as a fixture, in the corner of every field garden shed. Supply this vessel occasionally with a portion of *Oil of Vitriol*, or what may be better, *spirits of salt*, and as near as you can judge, in the proportion of one part by weight of either acid, and three or four of water, and therein keep up a gradual dissolution of bones, by regularly feeding the fluid with them. To this end let not a bone of any kind depart from your premises, gather all you can for this purpose ; pound them with a mallet into very small fragments, boil them well in water, and pour the whole into the *scouring tub*, adding acid in proportion, and stirring frequently with a wooden rod. The acid will penetrate their substance, dissolve their earthy part, and leave the animal matter behind in soft masses. Thus you will have a continual supply of bone solution, wherewith to feed the guano-compost, a description of which follows.

Note well. *Oil of Vitriol being a most corrosive substance, must be used with extreme caution ; and should a drop fall upon any part of the person, or clothing, let such part be plunged, instantly, into cold water, and well washed.*

"Guano, or the dung of birds generally, possesses the united virtues of both the liquid, and solid excrements of animals."

*Home made Guano.*—Mix the contents of the Portable Pails, in the manner described in page 11, with three times the bulk of finely sifted coal-ashes, along with a few pounds of gypsum. Beat the mixture up with as much of the "bone solution" as it will retain. Spread the heap to dry spontaneously in a corner of the shed ; as it does so, add from time to time, and diffuse equally over the heap, as much chamber-lye as it will retain. While the mixture still continues to dry, sprinkle it with the *bone solution* and *chamber-lye* alternately, but keep the latter in excess. Thus you may enrich the mess to any degree. When there is a further supply of soil in the Pails, you may compound it afresh with the heap already formed, or proceed as before to make a new one. I need not describe the *rationale* of the process, but may remark that such a compost, after a sixth part of its weight of common salt has been added, must be a close imitation of the native guano.

Try all new plans on a small scale ;  
Some may succeed, should others fail.

*Artificial Guano.*—Always endeavour to make these useful things of home produce if you can do so. At the same time chemistry teaches us, in a very admirable way, how, by mixing ingredients together artificially, to imitate the native guano. The following composition is recommended by Professor Johnstone, as a substitute for guano, and it has been found by experiment, in a considerable degree, to approximate, in value, to that excellent manure.

## January.

*Week commencing Monday, January the 22nd, 1844.*

### Sussex.

**MONDAY**—*Willingdon School*. Boys digging for beans, and peas, after turnips. *Eastdean School*. Sixteen boys digging for peas, drilling, and covering them, and clearing away roots. *Piper*. Seeking mould under old hedges. *Dumbrell*. Digging, drilling peas.

**TUESDAY**—*Willingdon School*. Boys digging for peas, after turnips. *Eastdean School*. Boys digging turnip ground for barley, treading wheat, gathering weeds and stones. *Piper*. Grubbing out stones, for road making. *Dumbrell*. Digging, drilling peas.

**WEDNESDAY**—*Willingdon School*. Boys digging turnip ground, for beans and peas. *Eastdean School*. Boys digging ground, spreading tank liquid upon it, clod breaking, previous to barley sowing. *Piper*. Grubbing for, and drawing mould to the mixen. *Dumbrell*. Digging for, and drilling peas.

**THURSDAY**—*Willingdon School*. Digging, as yesterday. *Eastdean School*. Digging for mangel wurzel, spreading pig manure upon it. *Piper*. Drawing dung and mould to the mixen. *Dumbrell*. Manuring the wheat, digging and drilling peas.

**FRIDAY**—*Willingdon School*. Digging as before. *Eastdean School*. Taking in oat rick, and thrashing some for the pigs, having now twelve, and having fatted 60 stones of pork since harvest. *Piper*. Drawing mould to the mixen, and applying tank liquid to it. *Dumbrell*. Digging.

**SATURDAY**—*Willingdon School*. Drilling beans and peas. *Eastdean School*. Removing old thatch, stacking it for the pigs, cleaning school, and emptying the pails. *Piper*. Getting onion ground ready. *Dumbrell*. Digging.

### Dorsetshire.

#### *Operations during the Week.*

*Slaithwaite Tenants*. *James Bamford*. Draining. *Taylor*. Sowed one strike of barley, and the same quantity of tares, to be second cropped with Italian rye grass. *C. Varley*. Digging for oats and turnips, draining.

#### COW-FEEDING.

*Willingdon School*. Cows fed on swede turnips, and oat straw.

*Dumbrell's*. One cow fed as last week. One cow and heifer as last week.

## BAROCHAN GUANO: WOOD-ASH CHARCOAL.

*A mixture intended to equal, in effect, 1 cnt. of Guano.*

|                                              | Value.   |
|----------------------------------------------|----------|
| 78½ lbs. of bone dust, at 2s. 6d. per bushel | 4s. 4½d. |
| 25 „ of sulphate of ammonia .. ..            | 3 9      |
| 1½ „ of pearl-ash .. ..                      | 0 2½     |
| 25 „ of common salt .. ..                    | 0 6      |
| 2½ „ of dry sulphate of soda .. ..           | 0 2½     |

132½

At a cost of 9s. 0½d.

*All which substances, except the first, any druggist will supply.*

*Barochan Guano.*—The following is an artificial mixture which has been applied by Mr. FLEMING, of Barochan, in Scotland, to the turnip and other crops, with satisfactory results.

|                                                                       |             |
|-----------------------------------------------------------------------|-------------|
| Bones dissolved in <i>spirits of salt</i> , instead of oil of vitriol | 18½ lbs.    |
| Charcoal powder .. ..                                                 | about 18½ „ |
| Sulphate of ammonia, ( <i>gas salt</i> ) .. ..                        | about 9½ „  |
| Common salt .. ..                                                     | about 9½ „  |
| Gypsum .. ..                                                          | 9½ „        |
| Wood-ashes .. ..                                                      | about 46 „  |
| Nitrate of soda, ( <i>cubic petre</i> ) .. ..                         | 28 „        |
| Sulphate of soda, ( <i>Glauber salts</i> ) .. ..                      | 10 „        |
| Sulphate of magnesia, ( <i>Epsom salts</i> ) .. ..                    | 10 „        |

*Five cnt. applied to the Imperial acre.*

160 lbs.

“The great importance of manuring with wood-ashes, has been long recognized by agriculturists as the result of experience.”—*Leebg.*

*Wood-ash Charcoal.*—When you can procure, at small expense, the underwood of copses, or brushwood of any kind, reduce it into charcoal ash, in the following manner. Cut such materials into short pieces—pile them closely together into a heap and set the wood on fire. Quickly cover the heap well up with turf sods, earthy rubbish of any kind, or, if procurable, with slices of peat, never allowing the fire to break out into a flame. When the combustion ceases, reduce the charcoal-ash so formed into fine powder, and mix it with the earthy covering of the fire. It will form an excellent material, for mixing with native guano, or the contents of the portable pails, as it will be rich in charcoal, wood-ashes, and other matters.

“Carbon or Charcoal is capable of yielding slow but unceasing supplies of nourishment to living plants.”—*Prof. Johnstone.*

If the rough cordy roots of couch, or bent grass, or ling, are burned in a fire stifled with the rubbish or sods from old hedge-rows, or with soil scraped from the field, on compounding the ashes and earth together a similar but more friable compost will be formed.



## January.

*Week commencing Monday, January the 29th, 1844.*

### Sussex.

**MONDAY**—*Willingdon School*. Applying liquid and solid manure, for spring tares. *Eastdean School*. Twelve boys digging and sowing peas, and drawing manure to the drills. *Piper*. Planting carrots, and swede turnips for seed. *Dumbrell*. Digging.

**TUESDAY**—*Willingdon School*. Boys digging for spring tares. *Eastdean School*. Boys digging for oats, chopping clods for grit, picking off stones. *Piper*. Planting underground onions.\* *Dumbrell*. Digging, and drilling 12 rods with tares, heifer carrying dung.

**WEDNESDAY**—*Willingdon School*. Digging for spring tares. *Eastdean School*. The same as yesterday, boys emptying contents of the tank upon the ground. *Piper*. Planting underground onions. *Dumbrell*. Harrowing, picking up rubbish, digging, heifer carrying dung.

**THURSDAY**—*Willingdon School*. Digging as before, *Eastdean School*. Digging turnip ground up for barley, to mellow. *Piper*. Breaking up fresh ground. *Dumbrell*. Manuring wheat, digging.

**FRIDAY**—*Willingdon School*. Snow on the ground, boys in the school. *Eastdean School*. Snow, boys in the school all day, or thrashing oats, and platting straw. *Piper*. Thrashing barley. *Dumbrell*. Snowy day.

**SATURDAY**—*Willingdon School*. Snow, boys in the school. *Eastdean School*. Shovelling away the snow. *Piper*. Snow heaving. *Dumbrell*. The same.

### Yorkshire.

#### *Operations during the Week.*

*Slaithwaite Tenants*. *C. Varley*. Digging for turnips and oats, severe frost, and much snow after Tuesday, and all farming operations suspended.

#### COW-FEEDING.

*Willingdon School*. Cows fed on swede turnips, and oat straw. *Dumbrell's*. One cow stall fed as before. One cow and heifer stall fed as before.

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\* *Planting Underground Onions*.—Draw out a small drill, manure well, set your onions within the manured drill, and earth very slightly. Draw another drill, at the distance of 14 or 15 inches, and proceed the same, placing the onions 19 inches distant from each other. When they begin to grow, hoe round about, and pour tank liquid between the plants, but not upon them.

## WOOD-ASH AND ANIMAL CHARCOAL : WOOD-ASH AND BURNT CLAY COMPOST : PEAT CHARCOAL.

"M. SPRENGEL found that bones boiled, or burnt, still acted as manure; the fact has been corroborated by recent experiments."—*See Mr. Hannam's Essay.*

*Wood-ash and Animal Charcoal.*—By enclosing hard bones in fires of this kind, they will become calcined, in which state they may the more easily be reduced to powder, without perhaps losing much of their fertilizing property. These powdered and mixed with wood-ash and the earthy covering of the fire, will form a valuable compost. But of course the dissolution of bones in the acid of the *souring vessel*, is preferable for many reasons; and calcination ought never to be resorted to unless the density of the bones make them less soluble, or reduction to powder be found very difficult.

*Wood-ash and Burnt Clay compost.*—You may dispose of the clay from drains, &c., in a similar way, by burning it with brushwood. Kindle a fire, which, when moderately strong, cover up with sods and clay; kindle another fire of brushwood around the first, which stifle up as before. The clay in the interior becomes glowing hot, and retains its heat so as to render very little additional fuel necessary, and even by covering up with clay alone, the combustion may go on for some time. The wood-ashes and charcoal in conjunction will be found useful for many purposes; and M LEBIG has clearly proved that in general burnt clay acts beneficially by reason of its power of absorption.

*Peat Charcoal.*—A most valuable ingredient for forming composts with other substances remains unthought of but ready for our use upon the mountains, and the carbonization of bog-peat may hereafter become a new source of industry, while the conveyance of the product by railway to the plains may prove a boon to agriculture. If you live near to a peat-moss, try, like *John Bamford* to make *peat charcoal* by such a process as the following:—Dry a portion of peat, and kindle it into a fire, which enlarge by degrees until it is very hot, and there is little danger of its being easily extinguished, then cover it over with a thin layer of *moist* peat fresh from the bog, and as the moisture of the covering dries away and it begins to burn, cover up again with a somewhat thicker layer of moist peat; repeat this till the internal heat is such as to allow the peat to be thrown on in large masses without fear of the fire going out. I have seen an enormous mass of *peat charcoal* produced in this way with very little trouble—a capital article for mixing with guano—and a valuable top-dressing for the grasses or turnips.

## February.

*Week commencing Monday, February the 5th, 1844.*

### Sussex.

**MONDAY**—*Willingdon School.* Snow, boys in the school. *Eastdean School.* Twelve boys digging, and drawing manure for potatoes, picking stones. *Piper.* Thrashing barley, and from home on business. *Dumbrell.* Snow, no report.

**TUESDAY**—*Willingdon School.* Snow, no report. *Eastdean School.* Boys thrashing oats, removing turnips from the heaps for the cows, and cleaning the pigstye. *Piper.* Mending my roads. *Dumbrell.* Making a tank, for the pig-pound.

**WEDNESDAY**—*Willingdon School.* Boys digging wheat stubble. *Eastdean School.* The same kind of work as yesterday. *Piper.* Same as yesterday. *Dumbrell.* Digging.

**THURSDAY**—*Willingdon School.* Boys digging wheat stubble. *Eastdean School.* Boys emptying tanks, drawing out manure and mould for a mixen. *Piper.* Improving the road to my house. *Dumbrell.* Digging.

**FRIDAY**—*Willingdon School.* Boys digging up wheat stubble. *Eastdean School.* Boys digging, clod breaking, gathering roots, and treading tares. *Piper.* Improving the road to my turnip field. *Dumbrell.* Digging.

**SATURDAY**—*Willingdon School.* Boys sowing spring tares. *Eastdean School.* Boys thrashing, and cleaning oats, cleaning out piggery, portable pails, and school room. *Piper.* Moving potatoes for my pigs.\* *Dumbrell.* Digging.

### Yorkshire.

#### *Operations during the Week.*

*Slaithwaite Tenants.* No reports. Their labours are suspended for the present by the very inclement weather.

#### COW-FEEDING.

*Willingdon School.* Cows fed as before.

*Dumbrell's.* No variation in the feeding since last report.

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\* *Pigs.*—Pay attention to your pigs, they will assist to pay your rent, and remember if you sell your potatoes now, you will sell your dung heap. Boil them well with a little barley, or oatmeal, for the pigs, which feed rather sparingly than otherwise, thus keeping them in readiness for their meals. Over-feeding is as bad as not having enough. Throw over sometimes, to them a handful of mould, clinders, or grit, for such things when eating potatoes they always require.

PEAT COMPOST: POTASH COMPOST: EARTH AND ANIMAL MATTER  
COMPOST: RESERVOIR DEPOSIT.

*Peat Compost.*—The Rev. W. REAM recommends the following compost—one ton peat ashes, one cwt. soot, one cwt. of lime, one cwt. of common salt, 14lbs. saltpetre; to be mixed well together. It has been tried, by J. Bamford, and when applied to artificial grasses of the second year, found very beneficial.

“The meanest things fulfil most useful purposes.”

*Potash Compost.*—The following method of collecting the potash, &c. from kitchen slops, has been found to answer satisfactorily. A pit about two yards square, and two feet deep, the bottom puddled with clay and roughly paved, was formed in a garden. In dry weather, it is filled with loose, porous garden mould, yard sweepings, &c. The water from the sink is conveyed into every part of the mould, by a temporary drain of loose stones. The dry mould imbibes the fluid, part of which passes off by evaporation, leaving the *potash* or other alkaline matter behind.

When fully saturated the contents are removed and allowed to dry—composted with lime—sometimes with a further quantity of *potash* from the shops—turned over frequently, and after some months, mixed up with the farm yard manure for potatoes or turnips.

“There is not an atom of matter in creation, but has its uses.”

*Earth and Animal matter compost.*—Do not throw away a scrap of decayed animal substance of any kind: *blood—old rags—cropper's flocks—engine-waste—willy-dust*—gather up these, and all such things as may be offensive in their decay, and when divided, work them up together along with mould into a heap. Let this remain for a year, to be fully decomposed, turning it over several times. The watering of the mass with soap suds, or scourings from the cloth mill, will greatly increase its value. Very striking and long continued effects from the application of such a compost upon meadow land, are frequently witnessed in manufacturing districts, while the action of such substances in their undecomposed state is very slow, and in some cases almost negative, as many of you must have witnessed.

*Reservoir deposit.*—The deposit formed at the bottom of reservoirs and stagnant pools, when procurable, will prove invaluable in making your various composts; the owners of mills ought not to permit these things to be lost, but have them composted up with quick lime, and they would be well repaid for their trouble.

## February.

*Week commencing Monday, February the 12th, 1844.*

### Sussex.

**MONDAY**—*Willington School.* Boys digging wheat stubble. *Eastdean School.* Twelve boys digging, and forming a mixen for potatoes. *Piper.* Digging, and mending meadows with liquid—for now is the best time in the year. *Dumbrell.* Manuring wheat, digging.

**TUESDAY**—*Willington School.* Boys digging wheat stubble. *Eastdean School.* Boys digging two spits deep for carrots, manuring with tank liquid, and gathering stones. *Piper.* Fencing, and now is the time for hedging and ditching, you will have no time for it next month. *Dumbrell.* Manuring the wheat, digging.

**WEDNESDAY**—*Willington School.* Top dressing wheat with manure. *Eastdean School.* The same as yesterday and cleaning 4 bushels of oats for the pigs. *Piper.* Cleaning piggery out, mixing the dung with mould, and pouring tank liquid upon it. *Dumbrell.* Digging.

**THURSDAY**—*Willington School.* Top dressing wheat. *Eastdean School.* Boys digging, clearing out pig manure, mixing it with mould. *Piper.* Fencing—the proper time for planting white thorn and privet. *Dumbrell.* Digging.

**FRIDAY**—*Willington School.* Boys digging wheat stubble. *Eastdean School.* Boys thrashing oats, drawing manure, and opening turnip lumps. *Piper.* Sowing peas in drills.\* *Dumbrell.* Digging.

**SATURDAY**—*Willington School.* Boys turning manure heap. *Eastdean School.* Boys thrashing oats, trussing straw, emptying portable pails, and cleaning school room. *Piper.* Breaking up fresh ground—a good time to do it, the frost probably may yet come to destroy the vermin. *Dumbrell.* Digging.

### Wiltshire.

#### *Operations during the Week.*

*Slaithwaite Tenants.* John Bamford. Preparing compost, weather unfavourable.

#### COW-FEEDING.

*Willington School.* Cows living on swede turnips, and straw.

*Dumbrell's.* One cow stall-fed with turnips, mangel wurzel, and straw. The cow and heifer fed with turnips, carrots, and straw.

\* *Sowing Peas.*—Sow Peas in drills 8 or 9 inches apart, four bushels to the acre. Four bushels of small peas will seed your ground as well as five bushels of large ones

## HUMUS COMPOST: FIELD COMPOST.

"The substance called *humus* is woody fibre in a state of decay."—*Liebig*.

"The researches of M. Hermann go to prove that woody fibre, in rotting, attracts and fixes a quantity of atmospheric air."—*Boussingault*.

**Humus Compost.**—Mix well together into a heap, peat, spent dyewoods, tanners' "cobs,"\* refuse lime and hair, saw-dust, weeds green or dry, woody stems, the greater variety of such rubbish the better, with 30 or 40 lbs. of common salt, and about eight gallons of quick lime for every couple of one horse cart loads of the above materials. Turn the heap over several times, and when wholly decayed, let the compost be used along with farm yard manure for any kind of crop. This mixture will contain abundance of *humus*, which, when within the ground, in its decay attracts *oxygen*—forms with it *carbonic acid*—and gradually yields it up for the nourishment of the young plant in the early stages of its growth, afterwards furnishing a perpetual supply of this essential element to the more matured one.

"The most woody stems of vegetables decompose, pretty rapidly, when they are impregnated with urine and mixed with the droppings of animals."—*Boussingault*.

"Straw and the stems of leguminous plants, particularly the latter are in their very nature manures, as they contain Nitrogen."—*Idem*.

**Field Compost.**—It frequently happens that you have in the field a considerable quantity of clay, dead roots, sods, stubble, &c., loaded with much soil, heavy, and too large in bulk, to be borne conveniently to the farm yard for composting purposes; therefore, carry fresh manure to such materials, horse litter will be best, and let it be mixed with them as follows:—Place a layer of such rubbish, ten inches thick, upon the ground, and upon that a layer of dung of equal thickness, then another layer of rubbish, and so on alternately, until you have a large heap, which ought to be turned over several times, and its fermentation ensured. In a few months an excellent compost will thus be produced—ready to be applied to the turnip crop, or as a top-dressing to grass. Never burn field rubbish when it can be avoided, for the strongest, coarsest, *nicks*, may be destroyed in this way, and in a few months will be found quite dead and incapable of vegetating.

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\* A friend of mine, Mr. KAYE, intends to make use of the "cobs," or spent bark in his tannery, as follows:—In a field which he purposes to *thorough drain*, the open drains will be filled to the surface with "cobs," instead of stones; when converted into mould or *humus*, which will be the case in four or five years, it will be removed from the drains and spread over the intervening spaces, or removed elsewhere, and its place supplied with fresh "cobs" for future conversion into *humus*.

## February.

*Week commencing Monday, February the 19th, 1844.*

### Sussex.

**MONDAY**—*Willingdon School.* Boys digging wheat stubble. *Eastdean School.* Boys digging two spits deep for carrots, and manuring from the pigstye mixen. *Piper.* Digging. *Dumbrell.* Putting tank liquid to rye grass, digging.

**TUESDAY**—*Willingdon School.* Boys digging wheat stubble. *Eastdean School.* Boys emptying the liquid manure tank of the piggery, applying it to the ground for mangel wurzel, &c. *Piper.* Sowing peas. *Dumbrell.* Digging.

**WEDNESDAY**—*Willingdon School.* Boys digging wheat stubble, *Eastdean School.* Wet weather, boys thrashing, picking, sorting, platting straw. *Piper.* Emptying the tank. *Dumbrell.* Digging,

**THURSDAY**—*Willingdon School.* Very wet, boys in school. *Eastdean School.* Drawing manure to the mixen, for potatoes, digging for carrots, and spreading cowshed tank liquid upon it. *Piper.* Cleaning barley. *Dumbrell.* Collecting mould.

**FRIDAY**—*Willingdon School.* Very wet, boys in school, *Eastdean School:* Boys thrashing, and cleaning oats, trussing straw, sorting potatoes. *Piper.* Collecting flint stones, to mend roads at a future time. *Dumbrell.* Digging.

**SATURDAY**—*Willingdon School.* Boys digging wheat stubble. *Eastdean School.* Boys emptying pails, getting turnips, cleaning up the piggery, and school room, and to the mill with oats to grind. *Piper.* Removing potatoes within doors. *Dumbrell.* Digging, collecting mould.

### Yorkshire.

#### *Operations during the Week.*

*Slaitthwaite Tenants.* No report.

*Note.*—It appears, from a note of *John Bamford's* of the following week, that while the weather in *Sussex* had been open, and favourable for the work of the husbandman, except for a few days, that of *Yorkshire* had been such as to suspend out-door work, except at intervals, for some time.

#### COW-FEEDING.

*Willingdon School.* The same as before.

*Piper's.* Feeding on carrots, with straw once a day, and hay once.

*Dumbrell's.* The same as before.

**BONE COMPOST : SOAP ASHES COMPOST : SALTPETRE BED :  
STEAM ENGINE CINDERS.**

"There are few impediments in our way that ingenuity may not remove."

**Bone Compost.**—Mix heavy, unboiled bones, when full of grease and too hard to be effectually acted upon by acids, but broken small, with fine earthy mould, or *reservoir deposit*, turn the heap over several times; and when the bones have become open and porous, on the decomposition and extraction of their animal matter by the mould, rake out the larger fragments, which throw into the *souring vessel* that they may be dissolved by acid. The "bone solution" may afterwards, be mixed up with the remaining mould, so animalized, wetted with urine, and applied with farm yard manure to the turnip crop.

"The spent ashes of the soap boiler are marl, bone dust, plaster, and alkali combined."—*Dana*.

**Soap Ashes Compost.**—Mix soap ashes with mould from the *Potash Compost Pit*, with other earth and coal ashes, or with wood-ashes—with *peat-ash compost*—or any substance known to contain alkaline matter, let these things act upon one another for some time, and turn over the heap. When well mouldered, use the mixture for the potatoe or turnip crop with farm yard manure.

"The ancients considered him a bad husbandman who buys what his farm can produce him."—*Pliny*.

**Saltpetre Bed.**—By mixing good mould, or reservoir deposit with soap ashes, and then forming successive layers of that mixture, and cow dung, each layer being about four inches thick, upon a tight floor and under cover—by moistening the mass with urine, and shovelling it over occasionally; in three or four years a fine compost will be produced, rich in *humus* and *saltpetre*, which may be used as a top-dressing upon corn crops with great effect.

"So too coal ashes, even your hard anthracite ashes yield all the substances that spent ashes do."—*Dana*.

**Steam Engine Cinders.\***—These ground into fine dust between rollers, or a pair of stones turned by the steam-engine—even the

\* Messrs. VICKERMAN & Co., of Steps Mills, near Huddersfield, taking the hint given at pages 11 and 12 of this "Manual," are already making arrangements for collecting at their extensive works, the "night soil," which has hitherto flowed into the river. Near to the premises, but quite apart from the workmen, they are erecting a pair of rollers to be turned by the steam-engine, for grinding *engine cinders* into dust and compounding it with "gypsum," *bone solution*, and the contents of a great number of *Portable Pails*. The *domestic guano* thus produced will be dried upon a floor, heated by steam to a temperature of 90° or 100°, in a shed open at the sides, but covered with a Asphalt cloth. This public spirited example will doubtless soon be followed by others, when they become aware of the great profit that may be reaped at an expense so trifling, in the outlay and in labour.



## February.

*Week commencing Monday, February the 26th, 1844.*

### Sussex.

**MONDAY**—*Willingdon School.* Boys raking wheat stubble from the young clover. *Eastdean School.* Twelve boys digging for carrots, applying tank liquid, picking up roots and stones. *Piper.* Getting flints for future use *Dumbrell.* From home.

**TUESDAY**—*Willingdon School.* The same as yesterday. *Eastdean School.* Digging for carrots, treading and weeding the tares, putting in beans, and planting cabbages. *Piper.* Cleaning piggery out, and composting the dung with mould. *Dumbrell.* Digging, and stacking litter.

**WEDNESDAY**—*Willingdon School.* Boys raking clover, turning dung, sowing a little rye for experiment. *Eastdean School.* Boys emptying pigstye tank, carrying dung to potatoe mixen, weeding clover, picking stubble. *Piper.* Removing potatoes within doors. *Dumbrell.* Digging, carrying manure for oats.

**THURSDAY**—*Willingdon School.* Boys raking clover. *Eastdean School.* Putting in peas, carrying manure for tares, treading wheat, picking stones. *Piper.* Digging, has a wonderfully fine calf to-day, from the cow he works in harness. *Dumbrell.* Digging, pulling turnips, wheeling manure.

**FRIDAY**—*Willingdon School.* Boys raking stubble. *Eastdean School.* Boys thrashing oats, trussing straw, and clearing the oats for seed. *Piper.* Emptying the tank, pouring liquid upon the mixen. *Dumbrell.* Digging, wheeling out manure, putting tank liquid to rye.

**SATURDAY**—*Willingdon School.* Boys gathering stones off the clover. *Eastdean School.* Boys emptying privy pails, and tank from the cows, cleaning out the piggery, and school room. *Piper.* Digging for carrots, to be sown in the latter part of March *Dumbrell.* Digging, and wheeling out manure.

### Yorkshire.

#### *Operations during the Week.*

*Slaithwaite Tenants.* No return.

#### COW-FEEDING.

*Willingdon School.* Changed to white carrots, and straw, *Dumbrell's.* The same as before.

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*Soot.*—Now provide soot for wheat, or seeds, and sow it about the beginning of March, after the rate of 30 bushels an acre, with 5 or 6 bushels of rough salt.

**GAS LIME AND TAR : AMMONIA IN GAS WATER : MILL SEAK :  
TURNIP PLANTING FOR SEED.**

slag from the iron furnace, ground to dust by carriage wheels on the roads—would form a valuable material for mixing up with every kind of waste manure ejected from manufactories, and for applying to clay soil.

*Gas Lime and Tar.*—Mix these things and a large quantity of *reservoir deposit*, well together, or with mould, rubbish of old buildings, or of buildings burned down; let the heap remain for a year turning it over several times, when it may be applied, after potatoes or turnips, to corn.

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“Ammonia is the heart of manure, and keeps up the healthy circulation among the other members.”—*Dana*.

Ammonia in Gas Water.—May be fixed by saturation with sulphuric acid, as follows :—Fasten to the end of a stick a piece of yellow turmeric paper, which the druggist will supply, and while you gently pour *oil of vitriol* into the ammoniacal gas water, holden in a tub, an attendant stirring them well together, plunge, from time to time, the paper into it, and when the original yellow colour is restored and it ceases to become brown, desist from adding more acid, as the point of saturation is about being attained. The sulphate of ammonia, thus formed and remaining in solution, may be diluted with much water, and sprinkled on grass, and wheat, or, it may be poured into the tank to strengthen the liquid there.

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“Why should my streams and rivulets run idling along—when they cannot be made to do work more useful—let them be turned aside, and spread over the land—to raise *corn* and *rice* for my people—and *tea* for the barbarians.”—*Chinese Emperor*.

*Mill Seak.*—The grosser parts of the valuable “scourings” ejected from the fulling mill and dyehouse, on subsidence from the bulky fluid containing them, form a most valuable compost when mixed with mould and well ground engine cinders; while the fluid itself containing abundance of alkaline and other matters, would be found invaluable for irrigating land in the vicinity of the manufactory. In some cases, by pumping it to a higher level, in others, by leading it, through drainage and good arrangements, to a lower situation, the finest water meadows, and of almost infinite fertility might thus be formed, and, in most cases, at an expense, that would return good interest for the outlay.

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PLANTING SEED TURNIPS.

Now plant the turnips you reserved in the fall for seed. Select a corner in the field or garden—away from all other plants, well sheltered, and let the soil be well digged and in good condition; place the roots within it, at a good distance from each other, covering them nearly over with earth.

March.

Week commencing Monday, March the 4th, 1844.

Sussex.

MONDAY—*Willingdon School*. Boys digging the second time for white carrots. *Eastdean School*. Boys treading clover, removing stubble and roots, and turning a mixen. *Piper*. Gathering up flints for draining. *Dumbrell*. Rainy day.

TUESDAY—*Willingdon School*. Boys digging as before stated. *Eastdean School*. Boys digging for potatoes, picking out the roots, and covering a mixen with mould to keep the heat in. *Piper*. Top dressing seeds. *Dumbrell*. Wheeling out manure.

WEDNESDAY—*Willingdon School*. Boys digging the second time for white carrots. *Eastdean School*. Boys emptying tank, and spreading the contents on mangel wurzel ground, breaking clods, and mould carrying. *Piper*. Removing turnips to the byres. *Dumbrell*. Digging, and spreading manure.

THURSDAY—*Willingdon School*. Boys clearing away stubble from the clover. *Eastdean School*. Boys digging, hoeing tares* and rye, and treading the same, small boys picking stones. *Piper*. Hoeing among underground onions,—*don't loosen them*. *Dumbrell*. Digging, and spreading manure.

FRIDAY—*Willingdon School*. Boys removing swede turnips from the heap. *Eastdean School*. Boys widening road, removing mould to the land, gathering stones, and turning a mixen. *Piper*. Hoeing among the onions,—*always hoe your seed turnips, and carrots as well*. *Dumbrell*. Planting early potatoes, drilling tares.

SATURDAY—*Willingdon School*. Wet weather, boys in school all day. *Eastdean School*. Boys cleaning out piggery, and portable pails, about the place, and school room. *Piper*. Cleaning out the piggery, mixing dung with mould. *Dumbrell*. Digging and harrowing wheat.

Yorkshire.

Operations during the Week.

Slaitwaite Tenants. John Bamford. Digging for spring wheat. Weather fine, but frosty.

COW-FEEDING.

Willingdon School. Cows fed on oat straw, and turnips. *Dumbrell's*. Cows fed as before.

* *Tare Hoing*.—The hoeing of your winter tares must not be neglected. A top dressing of 20wt. of gypsum will be beneficial. All leguminous or pod plants require it, as animals require salt, or taws require lime.

BEANS.

March.

"In March and in April, from morning to night,
In sowing and setting must be your delight."—*Tusser.*

GENERAL RULE.

"The best manure for plants is always found to be that of the animals which feed upon them. For, the excrements of animals must contain many of the inorganic constituents of the food they eat, and therefore must be best adapted for the growth of the same food."—*Vide Dr. Playfair's Lect.*

PRINCIPAL INORGANIC CONSTITUENTS.

- I. *Plants which require Potash and Lime.*—Peas, Vetches, Red Clover, Lucerne, Sainfoin, Meadow Hay, &c.
- II. *Plants which require much Silica.*—Oats, Barley, Wheat, Rye, &c.
- III. *Plants which require much Potash, Soda, and Lime.*—Swede Turnips, Cabbages, Rape, Beet, Carrots, &c.
- IV. *Plants which require Phosphate of Lime, (Bone earth)*—Rye, Oats, Barley, Wheat, Beans, Peas, Vetches—when maturing seed—and most root crops.

Observation.

These things, with other ingredients, being found as component parts, must be required by them, and ought to be present in the manure we apply to such plants, and, therefore, previous to its application we must enquire:—

- 1st. What specific ingredients will be wanted by the plant we intend to raise?
- 2nd. Whether they are already present in the soil?—If absent, we must endeavour to supply them by means of manures wherein they are contained.
- 3rd. We must apply manure so, that things which are rejected, or left behind, by one crop may be accepted by, and enter as constituents into the next crop in succession.

FOR EXAMPLE.

By incorporating with the soil a good quantity of *Lime* previous to such crops as those in I, such as peas, grasses, &c., and afterwards applying *Tank Liquid*, and other things containing abundance of *potash*, on the plants refusing to extract the whole, the remaining *potash* and *lime* promoting the solubility of the silica, will render it capable of entering, as food into the succeeding grain crops of II. While, again, mixtures of bone dust, dung, urine of cows, native guano, and domestic or home made guano, abounding in *earthy phosphates*, i. e. *alkaline salts*, and various nitrogenized matters, when applied plentifully to crops such as those in III, viz. swede turnips, &c. will, perhaps, not merely furnish a sufficiency of *potash* and *phosphates* to these plants, but part of them, with other matters will remain behind to promote the growth of future corn crops, and some of the ingredients absolutely refused by one crop may become appropriated by the other.

BEANS.

Seed Sown, 3½—when drilled, 3—when dibbled, 2 bushels per acre.

TIME OF SOWING, from January to March, not later; DISTANCE OF ROWS, when drilled or dibbled varying from 7 to 20 inches. DISTANCE OF SEEDS, in the row about three inches. DEPTH OF SEED, about four inches. AVERAGE PRODUCE, about 24 bushels.

REMARKS.

This is a cleaning crop, following corn, and ought to precede barley or wheat. Lime having been spread upon the stubble of the former crop may be ploughed, or digged in, and well mixed with the soil before winter. The seed may be sowed, drilled, or, what is preferable dibbled, placing two seeds in each hole, and covering them well up either on the level, or, on ridglets laid from east to west, formed by the plough, or otherwise, but at such a distance as to admit of the most perfect hoeing.

March.

Week commencing Monday, March the 11th, 1844.

Sussex.

MONDAY—*Willingdon School.* Wet weather, boys in school. *Eastdean School.* Wet day, boys platting, and at their multiplication tables, and writing. *Piper.* Cleaning and top-dressing lucerne, *do the same to your wheat, for now is the time.* *Dumbrell.* Rainy day.

TUESDAY—*Willingdon School.* Boys turning manure heap. *Eastdean School.* Boys digging, carrying manure for potatoes, mending the clover, picking roots and stones. *Piper.* Cleaning lucerne,—*manure it well, either with solid or liquid manure and mould.* *Dumbrell.* Planting cabbages, drilling tares, and digging.

WEDNESDAY—*Willingdon School.* Boys carrying out manure, for top-dressing wheat. *Eastdean School.* Boys emptying the tank, carrying its contents to the ground intended for mangel wurzel and carrots, sowing tares. *Piper.* Weeding wheat,—if you hoe it, and the ground be loose, let the plant be firm at bottom. *Dumbrell.* Planting cabbages, drilling tares, drilling oats, digging, and applying tank liquid to wheat.

THURSDAY—*Willingdon School.* Boys rolling and treading wheat. *Eastdean School.* Boys digging, gathering roots for the mixen, cleaning oats, and sorting pig potatoes. *Piper.* Weeding wheat, it will want no top-dressing, it was well dressed at the bottom when sown. *Dumbrell.* Drilling oats.

FRIDAY—*Willingdon School.* Boys rolling and treading wheat. *Eastdean School.* Boys digging, rolling and mending tares, getting in turnips and mangel wurzel, for the cows. *Piper.* Mending wheat, not often too strong near Beachy-head, and if so, a crop without manure will cure it. *Dumbrell.* Drilling oats.

SATURDAY—*Willingdon School.* Boys carrying tank liquid for the intended carrot crop. *Eastdean School.* Boys cleaning out pig-gery, replacing the turf where mould for the mixen was got, clearing up. *Piper.* Emptying the tank. *Dumbrell.* Drilling oats, sowing onions in the garden, planting cabbages.

Dorsetshire.

Operations during the Week.

Slaithwaite Tenants. John Bamford, in a note appended to his return, says, "Nothing has been done with the exception of turning some dung. The weather has been of so stormy a character, attended with frost and snow, that general farm labour has been out of question. I got the tare seed ready a fortnight ago but as yet, there has not been an opportunity to sow any of it."

COW-FEEDING.

Willingdon School. Cows fed with clover, hay, and turnips. *Dumbrell's.* One cow fed in the stall with mangel wurzel, carrot, and straw. One cow and heifer fed with turnips, carrots, and straw.

PEAS : INGREDIENTS IN MANURES.

The Bedn crop, fully matured, withdraws from the soil per acre,—

Potash, 88lbs.; Soda, 21½lbs.; Lime, 33½lbs.; Magnesia, 13½lbs.; Silica, 13½lbs.; Alumina, 1½lb.; Oxide of Iron, ½lb.; Oxide of Manganese, ¼lb.; Sulphuric acid, 3½lbs.; Phosphoric acid, 17½lbs.; Chlorine, 5lbs.—*Sprengel*.

Articles likely to furnish the above ingredients are,—

About ten tons of dung, tank liquid, "bone solution," night soil, urine, gypsum, ashes and mould, mixed together, fermented, and applied with the seed.—Top dressings, *Domestic Guano*, page 65—native guano—gypsum—potash compost—wood ashes—salts of ammonia, &c.

PEAS.

Seed usually drilled about 3 bushels per acre.

TIME OF SOWING OR DRILLING, from January to March. DISTANCE OF ROWS, varying from 12 to 27 inches according as the land is more or less foul. DEPTH OF SEED, two inches. AVERAGE PRODUCE PER ACRE, about 20 bushels.

REMARKS.

This crop like the former is a cleaning crop requiring, however, a lighter soil—may follow grass or clover—but is usually preceded and followed by a corn crop. Lime when used, is incorporated with the soil before winter, and in spring as early as possible the seed is drilled in rows laid from east to west, the earth on the north side being heaped up to defend the young plants from the north wind.

The Pea crop fully matured withdraws from the soil per acre,—

Potash, 28½lbs.; Soda, 16lbs.; Lime, 122½lbs.; Magnesia, 18½lbs.; Silica, 53½lbs.; Alumina, 4½lbs.; Oxide of Iron, 1lb.; Oxide of Manganese, ½lb.; Sulphuric acid, 16lbs.; Phosphoric acid, 15lbs.; Chlorine, 1lb.

Articles likely to furnish the above ingredients are,—

About 8 or 10 tons of dung, "bone solution," tank liquid, night soil, urine and ashes, mould, and gypsum, mixed together, fermented, and well mouldered, applied with the seed. *Top Dressings*—Salts of ammonia—gypsum—wood ashes—domestic guano—native guano, &c.

* * *Proportions in which some of the above ingredients are contained in manures.*

	Yard Dung yields per Ton.		Night Soil yields per Ton.		Urine yields per Ton.*		Raw Bones yield per Ton.	Guano yields per Ton.	
	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	lbs.	oz.
Potash.....	2	4	6	7	4	6	.....	66	8
Soda.....	1	10	4	10	8	7	.....	36	15
{ Phosphoric Acid { (Acid found in Bones)	5	1	120	0	3	4	580	283	9
{ Sulphuric Acid.. { (Oil of Vitriol) ..	1	4	.....	.....	5	6	.....	93	8
{ Chlorine..... { (Found in com. Salt)	1	9	.....	.....	6	1	.....	62	0

* *Berzelius' Analysis.*

"So that Bones give double the phosphoric acid that guano does, but they give no potash, soda, sulphuric acid, or chlorine. Rare

March.

Week commencing Monday, March the 18th, 1844.

Sussex.

MONDAY—*Willingdon School*. Boys digging the third time for white carrots. *Eastdean School*. Boys rolling and treading the wheat, and gathering stones. *Piper*. Sowing oats,—always select a fine time for doing it if you can. *Dumbrell*. Drilling oats, sowing cabbage seed, digging.

TUESDAY—*Willingdon School*. Boys digging as before. *Eastdean School*. Boys digging for oats, planting potatoes with manure, gathering roots and stones. *Piper*. Sowing oats, the white oat answers best for me. *Dumbrell*. Drilling oats, sowing carrots, and parsnips in the garden, rolling wheat, and digging.

WEDNESDAY—*Willingdon School*. Boys digging as before. *Eastdean School*. Boys carrying out the pigstye tank liquid to the mangel wurzel ground, weeding clover. *Piper*. Hoeing onions. *Dumbrell*. Digging, harrowing oats.

THURSDAY—*Willingdon School*. Boys harrowing, and rolling ground for carrots. *Eastdean School*. Boys digging, planting potatoes with manure, placing beans, and hoeing the cabbages. *Piper*. Preparing ground for carrots. *Dumbrell*. Digging, drilling oats.

FRIDAY—*Willingdon School*. Boys harrowing, and rolling carrot ground. *Eastdean School*. Boys taking in the last oat rick, clearing up, and planting potatoes with manure. *Piper*. Preparing ground for carrots. *Dumbrell*. Digging, and drilling oats.

SATURDAY—*Willingdon School*. Boys sowing spring tares, harrowing and dressing after it. *Eastdean School*. Boys thrashing oats, clearing up rick, cleaning out pails and school, and clearing oats. *Piper*. Sowing carrots,—a very proper time. *Dumbrell*. Digging, and drilling oats.

Wiltshire.

Operations during the Week.

Slaithewaite Tenants. *C. Varley* says, "We have had stormy weather since January, no work could be done on the land." Digging for oats this week, wheat stubble for turnips, gathering stones. *John Bamford*. Sowed tares. He says, "This week the weather has improved considerably; the snow has partially left our fields, and in some situations, and in certain conditions of the ground, farm labour has been performed; for instance, old lea has been turned up for oats, but such as was dug in autumn, has, up to Friday, been in far too wet a state to work." *James Bamford*. Digging for tares, removing clay.

COW-FEEDING.

Willingdon School. Cows fed the same as last week.
Dumbrell's. No variation in the fodder.

SPRING TARES OR LENTILS: CABBAGE SEED BED & TRANSPLANTING.

Dust contains no *potash*, *soda*, or *sulphuric acid*, so that if the land does not contain these, rape dust would be an inefficient, or only partial manure, so far as the above three ingredients are concerned. There are only four manures which will do to be applied alone, viz.: *Yard manure*—*guano*—*night soil* and *urine*. *Soot*—*blood*—*bones*—*rape dust*—and *nitrate of soda*, are only partial manures. *Guano* is worth thirty times as much as farm yard manure, as far as fertilizing matters go."—*Mr. Briggs, Far. Magazine.*

SPRING TARES OR LENTILS.

Seed sown, in drills, 2½—broadcast, 4 bushels per acre—with one-sixth part of Oats.

TIMES OF SOWING. *In successions from the beginning of March till May. As the plants on one plot appear above ground, sow another. DISTANCE OF DRILLS, six inches. DEPTH OF SEED, about two inches. PRODUCE IN GREEN FOOD, ten to twelve tons. IN GRAIN, 18 bushels.*

REMARKS.

This crop, in general, follows corn, and may, like the winter tare, be succeeded, when cut early for green food, by turnips, rape, or Italian rye grass. Reject seed which is dark skinned, very hard or old, and such as, when bit asunder, will not easily separate: and as regards manure and sowing, follow the directions given relative to the winter tare in page 27.

The Vetch crop fully matured withdraws from the soil per acre,—

Potash, 100lbs.; Soda, 16lbs.; Lime, 90lbs.; Magnesia, 15½lbs.; Silica, 24lbs.; Alumina, 1½lb.; Oxide of Iron, ½lb.; Oxide of Manganese, ½lb.; Sulphuric acid, 6½lbs.; Phosphoric acid, 15½lbs.; Chlorine, 4½lbs.—*Sprengel.*

Articles for furnishing the leading ingredients are,—

Lime and potash—caustic lime, well worked into the soil before winter—also wood ashes—lime and potash composts, &c. *To furnish the remaining ingredients,—* Mixture of farm yard dung, tank liquid, bone dust, human faeces, and urine applied with the seed. *Top dressings,—*native guano—or domestic guano—gypsum—salts of ammonia, &c.

CABBAGE SEED BED.

Half a pound of seed will produce plants for an acre.

Prepare, as before directed, page 18, seed beds, four feet broad, and sow in succession *Early hope*, *Scotch*, *Drumhead*, or other cabbage seed. As the shoots successively attain to proper size, they may be transplanted in all April, May, and June, and will come into use in September, October, and November, and some of the cabbages, particularly the *Drumheads*, may stand throughout the winter.

TRANSPLANTING CABBAGES.

Time of putting out plants from the seed bed sown in August, page 18, February and March: Distance of the rows, 2½ feet—plants from each other, 2½ feet. Average produce per acre, from 24 to 30 tons.

REMARKS.

This crop, like the former, is a cleaning crop, follows corn, and is succeeded by corn, but exhausts the soil, and, therefore, requires much manure. Lime being one of its leading ingredients, if not already present, must be supplied as before, and Knottingly lime, as it contains *magnesia*, will perhaps be found to answer best. In transplanting, dip the roots in a thin paste made of clay, cow-dung, tank liquid, and domestic guano, carefully place them above the manure, and in holes well moistened with water.

March.

Week commencing Monday, March the 25th, 1844.

Sussex.

MONDAY—*Willingdon School*. Boys digging second time for mangel wurzel. *Eastdean School*. Twelve boys digging, planting potatoes,* carrying manure, and gathering roots and stones. *Piper*. Turning mixen, and making it as fine as possible. *Dumbrell*. Digging for oats.

TUESDAY—*Willingdon School*. Boys digging same as yesterday. *Eastdean School*. Boys digging for and sowing oats, planting potatoes, digging for barley, and rolling, &c. *Piper*. Sowing carrots. *Dumbrell*. Drilling oats, digging.

WEDNESDAY—*Willingdon School*. Boys digging for skinless, or peruvian barley. *Eastdean School*. Boys digging, sowing oats, carrying tank liquid for the mangel wurzel and carrots. *Piper*. Hoeing seed carrots, and turnips. *Dumbrell*. Digging.

THURSDAY—*Willingdon School*. Boys digging as before. *Eastdean School*. Boys digging, sowing oats, thrashing oats, cleaning them for seed, cleaning out the piggery, &c. *Piper*. Hoeing onions. *Dumbrell*. Mending a fence.

FRIDAY—*Willingdon School*. Digging as before. *Eastdean School*. Boys digging, sowing oats, rolling clover, and treading it well, picking weeds, &c. *Piper*. Weeding wheat. *Dumbrell*. Carrying potatoes home, and dung back, mending a fence.

SATURDAY—*Willingdon School*. Boys turning manure heap. *Eastdean School*. Boys emptying portable pails, carrying manure to the tares, cleaning out tank, and school room. *Piper*. Weeding wheat. *Dumbrell*. Harrowing fallow with the heifer, digging.

Yorkshire.

Operations during the Week.

Slaithwaite Tenants. C. Varley. Road making. *John Bamford*. sowing spring tares, harrowing, preparing ground for sowing spring wheat, cleaning ground for oats.

COW-FEEDING.

Willingdon School. Fed the same as before.

Dumbrell's. No variation in the feeding.

* *Potatoes*.—Let your potatoe ridges be near three feet apart, your sets nine inches distant, and placed down whole, and your manure as fine as possible.

SPRING WHEAT : OATS.

The Cabbage or Rape crop, fully matured, withdraws from the soil per acre,—

Potash, 616lbs.; Soda, 193lbs.; Lime, 607lbs.; Magnesia, 67lbs.; Silica, 176lbs.; Alumina, 3½lbs.; Oxide of Iron, 50lbs.; Oxide of Manganese, 13lbs.; Sulphuric acid, 258lbs.; Phosphoric acid, 145lbs.; Chlorine, 173lbs.

Articles likely to furnish the above ingredients are,—

About twenty tons per acre of well fermented manure, consisting of farm dung, much tank liquid, "bone solution," night soil, urine, gypsum, common salt, potash compost, (see page 71,) wood ashes, coal ashes. This mixture may be placed immediately under the plants. Top dressings of sulphates of soda and potash, nitrates of soda and potash, gypsum, domestic guano, will be proper for supplying the *leading ingredients* required, viz.—*potash, lime, sulphuric and phosphoric acids*; and probably a little *copperas*, (sulphate of iron) may be found of use for furnishing oxide of iron.

SPRING WHEAT.

Seed sown, broadcast, 2½ bushels—dibbled, 1½ bushel per acre.

TIME OF SOWING, as early in March as possible. AVERAGE PRODUCE in grain, about 28 bushels and 1½ ton of straw.

REMARKS.

This crop follows turnips, cabbages, and other crops that cannot be early removed from the ground, and is followed by clover or grass seeds; for further directions, see what is stated relative to winter wheat at page 35.

The Wheat crop, fully matured, withdraws from the soil per acre,—

Potash, 6lbs.; Soda, 6½lbs.; Lime, 12½lbs.; Magnesia, 3½lbs.; Silica, 136½lbs.; Alumina, Oxides of Iron and Manganese—a very little; Sulphuric acid, 2½lbs.; Phosphoric acid, 8½lbs.; Chlorine, 1½lb.

Articles likely to furnish the above ingredients are,—

Previous applications of *Lime*, and things containing *potash*, promoting as they do the solubility of the *Silica* of the soil, which in grain crops appears to be the *leading ingredient*. Top dressings of salts of ammonia—and things that contain nitrogen rape dust—salts of soda; also *domestic guano*—*native guano*, &c. have been found of great advantage in certain cases, the two latter contributing a good supply of phosphoric acid to the grain.

OATS.

Seed sown, broadcast about 6—in drills 5 bushels per acre.

TIME OF SOWING, early in March as possible. DISTANCE OF DRILL, six inches, DEPTH OF SEED, two inches. AVERAGE PRODUCE, about 30 bushels.

REMARKS.

The oat crop, in general, follows grass or clover, it may follow potatoes, and is succeeded by rape or winter tares the same year, or by turnips the following year. Early sowing gives weight to the grain, late sowing weight to the straw. Procure your seed from the fens if possible, or from a poorer soil, let it be good and heavy, and be steeped as follows:—Dissolve 24lbs. of common salt, in twelve pails of water—introduce six bushels of seed into the solution, and let it remain there twelve hours, and when removed, drain for one hour, it will then easily divide and may be sown immediately. This steeping it is said increases the produce in meal after the rate of one pack per acre, and causes the corn to ripen a fortnight earlier than usual.

The Oat crop, fully matured, withdraws from the soil per acre,—

Potash, 42lbs.; Soda, 3lbs.; Lime, 8½lbs.; Magnesia, 2½lbs.; Silica, 248lbs.; Alumina, ½lb.; Oxide of Iron, 1lb.; Oxide of Manganese, one-tenth of a lb.; Sulphuric acid, 4½lbs.; Phosphoric acid, 2lbs.; Chlorine, ½lb.

April.

Week commencing Monday, April the 1st, 1844.

Sussex.

MONDAY—*Willington School*. Boys harrowing, and drilling ground for white carrots. *Eastdean School*. Boys digging, sowing oats and tares mixed, carrying manure, planting potatoes. *Piper*. Assorting potatoes. *Dumbrell*. Digging, heifer carrying manure.

TUESDAY—*Willington School*. Boys sowing white carrots. *Eastdean School*. Boys digging, clearing weeds and stones, and rolling for barley. *Piper*. Weeding wheat. *Dumbrell*. Digging, heifer carrying dung.

WEDNESDAY—*Willington School*. Boys harrowing, and rolling ground for peruvian barley. *Eastdean School*. Boys carrying tank liquid to the mangel wurzel and carrot ground, weeding tares and wheat. *Piper*. Weeding wheat. *Dumbrell*. Digging, heifer carrying manure.

THURSDAY—*Willington School*. Boys sowing peruvian barley. *Eastdean School*. Boys digging for barley, planting potatoes, weeding tares and wheat. *Piper*. Hoeing wheat. *Dumbrell*. Going a journey.

FRIDAY—*Willington School*. Holyday. *Eastdean School*. Holyday. *Piper*. At church on Good Friday, and says "he has never seen a bad one yet." *Dumbrell*. Good Friday.

SATURDAY—*Willington School*. Boys rolling wheat. *Eastdean School*. Boys thrashing and clearing oats, chopping the straw, clearing out pails, piggery, and school room. *Piper*. Digging ground after turnips. *Dumbrell*. Harrowing peas, fallow, and wheat, clearing away rubbish.

Worshshire.

Operations during the Week.

Slaithwaite School. Eleven to thirteen boys occasionally at work, preparing ground for oats. *James Bamford*. Sowing and harrowing oats, spreading manure, removing clay, sowing peas and beans, mixed together, for soiling cattle. *C. Varley*. Digging for oats, mixing cow and privy manure together. *John Bamford*. Forking up, beating the soil fine, picking the couch grass roots.

COW-FEEDING.

Willington School. Cows fed on white turnips, and clover hay.

Dumbrell's. Cows stall-fed with turnips, mangel wurzel, and straw. One cow and heifer fed with turnips, carrots, and straw.

SPRING RYE: TOP DRESSINGS.

March.

Articles likely to furnish the above ingredients are,—

The same as for wheat, the *leading ingredient* withdrawn being *Silica*. Things rich in Nitrogen—night soil and ashes—domestic guano—guano, &c. are beneficial to this crop as well as to wheat; and as it extracts more *potash* than wheat, we must carefully serve it well with wood-ashes, potash compost, &c. A dressing of quick lime, where much peat and vegetable matter is present in the soil, is generally found useful; in some cases, however, caustic lime applied with the seed has not been found so.

SPRING RYE—TO MATURE SEED.

Seed sown, in drills, 2½—broadcast, 3 bushels per acre.

TIME OF SOWING, at latest by the end of March. **DISTANCE OF ROWS**, six inches. **DEPTH OF SEED**, about 1½ inch—not too deep. **AVERAGE PRODUCE**, about 24 bushels.

REMARKS.

This crop may be substituted, in the succession, for oats, and will grow on poorer soil than wheat. M. Von Thier says, "Rye is the most nourishing grain next to wheat."

The Rye crop, fully matured, withdraws from the soil per acre,—

Potash with Soda, 13½lbs.; Lime, 10½lbs.; Magnesia, 1½lb.; Silica, 105½lbs.; Alumina with Oxide of Iron, 2½lbs.; Oxide of Manganese, ½lb.; Sulphuric acid, 8lb.; Phosphoric acid, 3½lbs.; Chlorine, 1lb.

Articles likely to furnish the above ingredients,—

Like wheat and oats this crop must be served with animal manures, containing nitrogen and phosphoric acid, which will be required to bring the seed to perfection. As the rye plant withdraws ingredients of the same kind but in smaller quantity, the articles applied as *restorants* must be the same as for oats and wheat, but less of them may suffice.

TOP DRESSINGS.

On Winter Wheat, Tares, and Rye.—Where you observe these crops failing, apply a light dressing of the *field and humus composts* (see p. 73); and allowing it to remain a week upon the surface to receive the falling showers, let the land be well hoed, and you will find that even a small dressing and the subsequent hoeing, will pay well for the labor bestowed. Crops can never be hoed over-much, whether there are weeds present or not, for hoeing will prevent their growth, and let the air into the soil without the free entrance of which there can be but imperfect vegetation.

On Clover.—Two cwt. of gypsum per acre—to be strinkled upon the sward while wet with dew, or during a falling shower—after which let it be heavily rolled.

On Winter Tares.—Two cwt. of gypsum per acre to be applied the same—afterwards the crop to be well hoed.

On Winter Wheat.—I. Six cwt. of *domestic guano* to be applied to the crop per acre—or—

II. Soot ten bushels, common salt five cwt., to be mixed with coal ashes, and applied per acre as above.—or—

April.

Week commencing Monday, April the 8th, 1844.

Sussex.

MONDAY—*Willingdon School*. Boys digging ground, and planting early potatoes. *Eastdean School*. Holyday for boys, master thrashing oats, and cutting straw. *Piper*. Hoeing wheat, for he says, if he allows himself to be idle now, he must not expect anything in harvest. *Dumbrell*. Rolling rye grass, putting tank liquid to it, harrowing wheat, planting potatoes.

TUESDAY—*Willingdon School*. Boys planting early potatoes, digging ground. *Eastdean School*. Boys sowing oats, hoeing wheat, rolling peas and tares. *Piper*. Hoeing wheat, and in four or five months, says, *he will be rewarded for it*. *Dumbrell*. Drilling tares, harrowing wheat and fallow, rolling the latter, and sowing clover on the wheat.

WEDNESDAY—*Willingdon School*. Boys planting potatoes as before. *Eastdean School*. Twelve boys emptying the tank, digging for, and sowing barley, sowing clover on the wheat, rolling it, and earthing up cabbages. *Piper*. Turning mixen, and putting tank liquid upon it. *Dumbrell*. Sowing clover upon the wheat, and harrowing in, digging.

THURSDAY—*Willingdon School*. Boys digging, and planting early potatoes. *Eastdean School*. Boys digging, and planting potatoes, manuring them, sowing barley, picking roots and stones. *Piper*. Digging, and getting the ground fine at top immediately, or it will be unkind in working. *Dumbrell*. Spearing potatoes, hoeing wheat.

FRIDAY—*Willingdon School*. Boys digging for, and planting early potatoes. *Eastdean School*. Boys sowing barley, planting potatoes, removing from the lump, and assorting potatoes. *Piper*. Planting potatoes, his cow draws the manure, and he will "defy any farmer to shew one better for her age." *Dumbrell*. Hoeing wheat, heifer carrying dung and potatoes.

SATURDAY—*Willingdon School*. Boys planting potatoes as before. *Eastdean School*. Boys clearing out pails, piggery, school room, and getting cow fodder for to-morrow. *Piper*. Digging, dredging the grass. *Dumbrell*. Digging, heifer dredging grass.

Yorkshire.

Operations during the Week.

Slaithwaite School. From twelve to sixteen boys occasionally at their afternoon labour. Digging, clodding, sowing, and harrowing oats.

C. Varley. Sowing oats, harrowing spring tares, and preparing ground for turnips. *James Bamford.* Forking over ground for turnips, filling drains, mending roads. *John Bamford.* Spreading lime and ashes, sowing oats, and harrowing, sowing tares, preparing ground for turnips, spreading compost.

COW FEEDING.

Willingdon School. Cows eating white turnips, which have stood the winter, and clover hay.

Dumbrell's. Cows stall-fed as last report.

SALINE—AND LIQUID TOP DRESSINGS.

March.

III. Three cwt. of guano—to be mixed intimately with fine mould, or coal ashes, and sown per acre as above.—or—

IV. Two or three cwt. of pigeon or barn yard fowl dung, mixed with two cwt. of domestic guano, and sown per acre as above.—or,

V. Five cwt. of rape dust, sowed per acre as above.

Saline Top Dressings for one acre of Winter Wheat or Mowing Grass.

1st. Sulphate of ammonia (*gas salt*) $\frac{1}{2}$ cwt.; bone dust, 4 cwt.; wood ash charcoal, (p. 67) 5 cwt.—or—

2nd. Nitrate of soda, 1 cwt.; bone dust, 3 cwt.—or—

3rd. Nitrate of potash (*saltpetre*) 1 cwt.; gypsum, 2 cwt.; bone dust, 3 cwt.

Reduce the salts to powder—mix all the ingredients up with fine mould and coal ashes, and sow the mixture when a fall of rain is expected, upon failing wheat or grass.

TOP DRESSING OF LIQUID MANURE.

"This manure (*tank liquid*) thickens the sward of grass; and when applied to the previous clover lay, increases the following grain crop *one-third*; and benefits wheat to the extent of *one-fourth*."—*Mr. Howly.*

Phosphated Tank Liquid.—The common liquid of the tanks, producing as it does very extraordinary effects, is far exceeded in power as a top dressing, by the article whose description follows:—Into your *souring tub* put six gallons of water—add 20lbs of *oil of vitriol* and 40lbs. of bones finely divided—stir the mixture frequently—and when the bones are dissolved and nothing remains except the cartilaginous parts, pour the semi-fluid mixture into the liquid manure tank. The contents, if amounting to about 500 gallons, will be nearly neutralized, and when sprinkled regularly upon about one-third of an acre of mowing grass, or winter wheat, will produce great effects. Be not afraid of applying this fluid to your crops. There is no corrosive quality within it, a mild saline substance, and insoluble tasteless earthy matters having taken the place of the corrosive *oil of vitriol* that was added.

April.

Week commencing Monday, April the 15th, 1844.

Sussex.

- MONDAY**—*Willingdon School*. Boys digging, and planting early potatoes. *Eastdean School*. Eight boys in school, rest working for farmers, digging, and sowing carrot seed, planting and manuring potatoes. *Piper*. Carrying fine worked manure, for potatoes. *Dumbrell*. Digging, and carrying dung with the heifer.
- TUESDAY**—*Willingdon School*. Same as yesterday. *Eastdean School*. Boys digging for and sowing barley, hoeing peas, and gathering roots and stones. *Piper*. Preparing ground for potatoes. *Dumbrell*. Digging, hoeing wheat.
- WEDNESDAY**—*Willingdon School*. Boys sowing clover seed on wheat, and harrowing in. *Eastdean School*. Boys emptying piggery tank, rolling oats, weeding wheat, removing refuse. *Piper*. Planting potatoes. *Dumbrell*. Digging.
- THURSDAY**—*Willingdon School*. Boys harrowing wheat. *Eastdean School*. Boys digging, planting potatoes, sorting potatoes, and preparing turnip ground. *Piper*. Planting potatoes. *Dumbrell*. Digging, rolling wheat.
- FRIDAY**—*Willingdon School*. Boys harrowing wheat. *Eastdean School*. Boys planting potatoes, sowing barley, weeding wheat, clearing away roots and stones. *Piper*. Scraping up manure. *Dumbrell*. Harrowing wheat.
- SATURDAY**—*Willingdon School*. Boys digging ground and manuring for mangel wurzel. *Eastdean School*. Boys cleaning out the piggery, portable pails, school room, and thrashing and cleaning oats. *Piper*. Planting potatoes. *Dumbrell*. Drilling carrots.

Wiltshire.

Operations during the Week.

Slaithwaite School. From eight to eleven boys at afternoon labour, breaking clods, gathering stones, and harrowing. *John Bamford*. Preparing turnip ground, spreading ashes thereon, planting potatoes. *James Bamford*. Drawing manure for potatoes, planting them, preparing ground for, and planting beans and peas. *C. Varley*. Preparing ground for turnips, manuring for and sowing tares, sowing peas and wheat together, and harrowing in; "weather mildest and richest ever witnessed here."

COW-FEEDING.

Willingdon School. Cows fed as before.

Piper's. Has begun to cut his rye, keeps it a day before he gives it to the cows, and mixes a handful of hay with it.

Dumbrell's. Fed as before.

CARROTS AND PARSNIPS : BARLEY.

March.

CARROTS—PARSNIPS.

Seed sown, in rows, Red Carrot, 3½lbs.; White Carrot, 3lbs.—Parsnips, 3½lbs. per acre..

TIME OF SOWING, *Parsnip seed, the first week in March—Red and White Carrot, from the middle of March to the first or second week in April. DISTANCE OF ROWS, about 12 inches. DISTANCE OF PLANTS IN THE ROW, set first at three inches, afterwards singled by head to six or eight inches. DEPTH OF SEED, slightly covered. AVERAGE PRODUCE, Carrots, about 12 tons—Parsnips, from 20 to 24 tons.*

REMARKS.

These, like other root crops, may, when well manured, follow corn, and be succeeded by corn—or, they may be intruded between crops of turnips and potatoes, in which case less manure will be required. The preparation of the ground for the carrot and parsnip is the same. It must be digged at least two spits deep before or during winter, and the digging repeated three times, incorporating liquid manure from the tank, and night soil mixtures, with the soil each time. When parsnip seed is to be sowed, it may be scattered at once, by hand, within the drills, as it divides easily; while the rougher seed of the carrot, having been mixed a fortnight before with sand, moistened with tank liquid, and turned over several times, may also be sowed in a similar manner. If sown broadcast, the quantity of these seeds must be increased. When in good sward, the plants will require the most careful hoeing, and adjustment to the proper distance.

BARLEY.

Seed sown, broadcast, 3—in drills, 2 bushels per acre.

TIME OF SOWING, *late in March, or early in April. DISTANCE OF DRILLS, six inches. DEPTH OF SEED, two inches. AVERAGE PRODUCE, about 36 bushels.*

REMARKS.

Barley may follow summer fallow, potatoes, or most green crops. It is better suited to follow turnips than either oats or wheat, and is generally succeeded by clover. The steep before recommended for oats may be made use of, adding with the common salt, a few pounds of Nitrate of Soda (*cubic petre*). After steeping the seed for a few hours let it be removed, parted with *gypsum*, and sowed immediately. When the surface of the soil is worked fine by moderate harrowing, the sowing of clover or other grass seeds may then take place, and either bush harrowing, or rolling may follow, the former when the soil is heavy, the latter when it is light and friable.

The Barley crop, fully matured, withdraws from the soil per acre,—

Potash, 14lbs.; Soda, 8½lbs.; Lime, 27lbs.; Magnesia, 7½lbs.; Silica, 175lbs.; Alumina, 7lbs.; Oxide of Iron, ½lb.; Oxide of Manganese, ½lb.; Sulphuric acid, 6½lbs.; Phosphoric acid, 1½lbs.; Chlorine, 3½lbs.

Articles likely to furnish the above ingredients,—

Barley extracts from the ground a larger quantity of ingredients than wheat, and with one exception (*Silica*) than oats. Similar manures will therefore be required by the three crops, but a greater abundance of them by the first. When Barley follows a turnip crop, most of the things it requires may be found left behind in the soil, and ready to be applied to general purposes. The *leading ingredient* it takes out of the ground being *silica*, should be in a fit state to enter the plant, brought about by judicious applications of *lime* and *potash manures* to former crops. The supply of Nitrogen, always essential to grain crops, must be ensured, either by previous manurings, or afterwards, by giving top dressings containing that element.

April.

Week commencing Monday, April the 22nd, 1844.

Sussex.

MONDAY—*Willingdon School.* Boys digging ground, planting mangel wurzel, the rows two feet apart, and the plants one foot distant. *Eastdean School.* Eight boys digging, planting potatoes, hoeing peas, and planting beans among the potatoes. *Piper.* Hoeing peas; the dry weather will assist you to kill the rubbish. *Dumbrell.* Planting potatoes.

TUESDAY—*Willingdon School.* Boys digging, and planting mangel wurzel. *Eastdean School.* Boys planting potatoes, hoeing peas, preparing ground for turnips and mangel wurzel. *Piper.* Planting potatoes. *Dumbrell.* Planting potatoes.

WEDNESDAY—*Willingdon School.* Boys digging, and planting mangel wurzel. *Eastdean School.* Boys cleaning out tank, and piggery, cutting and mixing straw and carrots together for the cows. *Piper.* Pulling turnips, and planting potatoes, where they grew, using solid manure. *Dumbrell.* Digging, dibbling, mangel wurzel, and planting potatoes.

THURSDAY—*Willingdon School.* Boys digging, and planting mangel wurzel. *Eastdean School.* Boys hoeing the wheat, planting potatoes, and manuring them with tank liquid, chopping straw and carrots together. *Piper.* Drawing out manure; dig my ground in the morning, and plant in the afternoon. *Dumbrell.* Digging, drilling tares.

FRIDAY—*Willingdon School.* Boys digging, and planting mangel wurzel. *Eastdean School.* Boys hoeing wheat, digging and planting potatoes, manuring with liquid as an experiment. *Piper.* Planting potatoes. *Dumbrell.* Digging, spearing potatoes.

SATURDAY—*Willingdon School.* Boys sowing a piece of lucerne, in drills, one foot apart. *Eastdean School.* Boys cleaning up the piggery, the garden, and planting there, rolling oats and tares, cleaning pails and school room. *Piper.* Planting potatoes. *Dumbrell.* Digging.

Yorkshire.

Operations during the Week.

Slaithewaite School. From eight to eleven boys at afternoon labour, drawing ashes, &c., spreading on the oats, harrowing, gathering clods, and rolling. *C. Varley.* Gathering roots, planting cabbages, planting potatoes, and preparing turnip ground. *John Bamford.* Preparing ground for turnips and tares, sowing and covering tares, preparing ground for Scotch cabbages.

COW-FEEDING.

Willington School. Cows fed on rye and a little hay in the stall.

Piper's. On turnips and rye, mixed with a little hay.

Dumbrell's. One cow fed till Wednesday with turnips, mangel wurzel, and straw; afterwards, on potatoes, mangel wurzel, and straw. One cow and heifer stall-fed till Wednesday with turnips, carrots, and straw; cow afterwards grazed in the pasture, heifer stall-fed with turnips, potatoes, and straw.

CLOVER, AND GRASS SEEDS.

March.

CLOVER, AND GRASS SEEDS.

FOR ONE YEAR'S HAY, PER ACRE.

Seed sown, Red Clover, from 12 to 18lbs., increasing the seed as the witness of the soil increases.—or—

Red Clover, 14lbs.—Annual Rye Grass, half a peck.

FOR ONE YEAR'S HAY AND ONE YEAR'S PASTURE.

Red Clover, 8lbs.—White Clover, 4lbs.—Perennial Rye Grass, 20lbs.—or instead of Perennial, Italian Rye Grass, 12lbs.—or—

Red Clover, 6lbs.—White Clover, 4lbs.—Yellow Trefoil, 3lbs.—Perennial Rye Grass, 20lbs.—or, instead of it, Italian Rye Grass, 12lbs.

FOR ONE YEAR'S HAY AND TWO YEAR'S PASTURE.

Red Clover, 3lbs.—White Clover, 4lbs.—Cow Grass, 4lbs.—Yellow Trefoil, 3lbs.—Parsley, 3lbs.—Perennial Rye Grass, 20lbs.—or, instead, Italian Rye Grass, 12lbs.

FOR TWO YEAR'S HAY.

Italian Rye Grass alone, three to four bushels—This crop, however, better follows Spring Tares removed early.

REMARKS.

Clover—or Clover mixed with other small seeds, are sowed among, and the plants nourished under the shade of such grain crops, as follow a summer fallow, or a well manured fallow crop. The clover and the grasses standing for a period are then followed by wheat. "Clover is the parent of wheat."—*Old Proverb.* On winter wheat sown broadcast, let the above small seeds be sowed after the spring harrowing.—On winter wheat sowed in drills, after the hoeing and top dressing in early spring, and previous to the rolling of the sward.—On spring corn sowed broadcast—after the corn has been well harrowed and the soil worked fine, let the small seeds, when divided into two portions, be sowed—one portion lengthwise—the other across—give the soil a light harrowing, and let the roller follow. When spring corn is sowed in drills, delay the sowing of clover, or other seeds, until the hoeing and top dressing of the young corn is completed, and proceed as before directed.

The Red Clover crop, (green) withdraws from the soil per acre,—

Potash, 76lbs.; Soda, 22lbs.; Lime, 106lbs.; Magnesia, 12½lbs.; Silica, 14lbs.; Alumina, 4lb.; Sulphuric acid, 17lbs.; Phosphoric acid, 25lbs.; Chlorine, 14lbs.

Articles likely to furnish the above ingredients are,—

Gypsum, to give Lime and Sulphuric acid—Home made or domestic guano,—or native guano, to give Phosphoric acid, potash, and soda, &c.—Common salt, to give Chlorine and Soda—Yard manure to give the general ingredients.

April.

Week commencing Monday, April the 29th, 1844.

Sussex.

MONDAY—*Willingdon School*. Boys digging up the ground as the rye is removed, and planting potatoes. *Eastdean School*. Boys digging, and planting potatoes, hoeing carrots, sorting potatoes, hoeing peas, and gathering weeds. *Piper*. Preparing turnip ground, making it as fine as possible. *Dumbrell*. Digging, heifer carrying dung.

TUESDAY—*Willingdon School*. Boys digging rye stubble, planting potatoes. *Eastdean School*. Boys digging, planting potatoes, sowing carrot seed, gathering weeds, sorting potatoes. *Piper*. Preparing turnip ground. *Dumbrell*. Digging, and planting mangel wurzel seed.

WEDNESDAY—*Willingdon School*. Boys digging rye stubble, for potatoes. *Eastdean School*. Boys emptying tanks, and applying liquid to the ground for mangel wurzel, breaking clods. *Piper*. Planting potatoes. *Dumbrell*. Digging, harrowing, and rolling fallow.

THURSDAY—*Willingdon School*. Boys digging rye stubble for turnips. *Eastdean School*. Boys digging and sowing carrot seed, manuring with tank liquid, weeding wheat, clearing roots and stones. *Piper*. Drawing manure for potatoes. *Dumbrell*. Digging, planting mangel wurzel seed, heifer carrying dung.

FRIDAY—*Willingdon School*. Boys digging rye stubble, carrying manure for swede turnips. *Eastdean School*. Boys thrashing and cleaning oats, breaking clods, gathering roots. *Piper*. Preparing manure for potatoes. *Dumbrell*. Digging, turning dung, carrying with the heifer.

SATURDAY—*Willingdon School*. Boys digging rye ground. *Eastdean School*. Boys planting potatoes, cleaning piggery, portable pails, and school room. *Piper*. Planting potatoes: "if I only half do my work I must expect only half a crop." *Dumbrell*. Digging.

Wiltshire.

Operations during the Week.

Slaitwaite School. Draining *James Bamford*. Planting potatoes forking up, and weeding. *John Bamford*. Planting cabbages, preparing ground, and ridging it for turnips.

COW-FEEDING.

Willingdon School. Cows fed on rye and a little hay.

Dumbrell's. One cow stall-fed with rye till Friday, afterwards with turnips, potatoes, and hay. Another cow grazed in the pasture. The heifer stall-fed with potatoes, and hay.

SWEDE TURNIP, AND KOHL-RABI SEED BED : POTATOES.

April.

Flesh coloured Clover.—*Trifolium incarnatum*. *Lin.* When the corn is reaped, on finding bare or patched places amongst the clover, let them be harrowed and sow the above kind of clover seed, and roll the seed in well; for the flesh coloured clover plant preferring a hard bottom, will most likely thrive and supply the place of the common clover and grasses.

SWEDE TURNIP, AND KOHL-RABI SEED BED.

Above all—provide stores of swede plants to be put out at the earliest possible period. Begin early in April to sow in succession, portions of the best seed you can procure, on beds four feet broad, in a well-sheltered corner of the turnip field or garden—Manure the ground a little, and, if the seed be good, sow it rather sparingly in rows six inches distant, covering it lightly over.—Also, sow a little of the overground Kohl-rabi or turnip rooted cabbage seed in the same manner. Be not discouraged should frost kill the first plants, but repeat the sowing until your crop is less endangered.

POTATOES.

Seed planted, from 8 to 10 cwt. per acre, of whole potatoes.

TIME OF PLANTING, early sorts in March—later ones in all April, or till the middle of May. DISTANCE OF ROWS, about one yard. DEPTH OF SEED, about four inches. AVERAGE PRODUCE, from eight to ten tons per acre.

REMARKS.

This being a cleaning crop will follow grass or corn, and may be succeeded by corn. The ground having been trenched and ridged up in rows out of grass or stubble, before winter or in early spring, (as described pages 49 and 50), let the weeds and rough parts of the ridges be combed with a rake, and made to fall upon and partially cover the sods, or stubble lying in the furrow; then place down the potatoes, and covering them with yard manure, split the remainder of the ridge with the hack or hoe, and draw the earth over the manure.

Guano.—Instead of yard manure you may safely employ guano. Mix four or five cwt. of the best guano, reduced to the finest powder, with four times its bulk of wood or coal ashes—pass the mixture repeatedly through a sieve, and after drawing over the potatoes a light covering of earth, sprinkle the mixture regularly above the same, and cover up in the usual manner. This quantity of guano will be quite sufficient for one acre of potatoes, and if it be good in quality, an abundant crop may be expected.

The Potatoe crop, roots only, withdraws from the soil per acre,—

Potash, 74lbs.; Soda, 44½lbs.; Lime, 6lbs.; Magnesia, 6lbs.; Silica, 1½lb.; Alumina, 1lb.; Oxide of Iron, ½lb.; Sulphuric acid, 10lbs.; Phosphoric acid, 7½lbs.; Chlorine, 3lb.

Articles likely to furnish the above ingredients,—

We may here remark that the ingredients contained in the large supply of yard manure, required by this crop, and which are extracted by the plant in maturity, must principally be taken up by, and go to the raising of, the haulm of the plant; for the root itself appears to be satisfied with the *nitrogenous portion* alone of the manure, and with a very moderate proportion of the above constituent ingredients. Hence, *potatoe haulm*, known to be full of alkaline matters, may be classed amongst the best manures for the potatoe crop, and ought to be reserved and applied to that purpose, along with the excrements of those animals who, for the most part, subsist upon this root.

May.

Week commencing Monday, May the 6th, 1844.

Sussex.

MONDAY—*Willingdon School.* Boys digging and manuring for potatoes after rye. *Eastdean School.* Ten boys digging, and planting potatoes, hoeing the forward ones, and weeding. *Piper.* Planting potatoes. *Dumbrell.* Dibbling mangel wurzel seed, digging.

TUESDAY—*Willingdon School.* Boys digging and manuring. *Eastdean School.* Planting potatoes, sowing carrot seed, hoeing tares, picking up the weeds for pigs and cows. *Piper.* Drawing manure to the ground where rye has just come off. *Dumbrell.* Dibbling mangel wurzel seed, and digging.

WEDNESDAY—*Willingdon School.* Boys digging and manuring. *Eastdean School.* Boys emptying tanks, and pouring liquid along the drills, chopping sods, and preparing for turnips. *Piper.* Digging rye stubble, mowing tares for soiling, *above three feet long.* *Dumbrell.* Dibbling mangel wurzel seed, and digging.

THURSDAY—*Willingdon School.* Boys digging and manuring for potatoes after rye. *Eastdean School.* Boys digging rye ground, planting potatoes upon it, gathering stubble, and laying it in the trench. *Piper.* Planting potatoes. *Dumbrell.* Digging rye stubble, placing mangel wurzel seed.

FRIDAY—*Willingdon School.* Boys digging rye stubble, and manuring for potatoes. *Eastdean School.* Boys planting potatoes, thrashing oats, cleaning piggery, and mixing dung with the mould. *Piper.* Planting potatoes; always watching my five pigs, which I feed on boiled potatoes and pollard. *Dumbrell.* Drilling tares, cutting potatoes, and digging.

SATURDAY—*Willingdon School.* Hand weeding wheat. *Eastdean School.* Boys thrashing and cleaning oats, digging, cleaning out portable pails, school room, and tank. *Piper.* Digging rye stubble. *Dumbrell.* Planting potatoes.

Yorkshire.

Operations during the Week.

Slaithwaite School. Boys finished draining, preparing ground for turnips, rolling oats.

COW-FEEDING.

Willingdon School. Cows fed on green tares once a day, and green clover the other.

Dumbrell's. One cow grazed in the pasture, and fed in the morn and even with rye grass. One cow stall-fed with potatoes and hay till Wednesday, afterwards grazed, and fed in the stall morn and even with rye grass. Heifer stall-fed with potatoes and hay.

MANGEL WURZEL.

April.

Artificial Manure for Potatoes, as a substitute for farm yard manure.

RECOMMENDED BY PROFESSOR JOHNSTONE.

Common salt, 1½ cwt.; Old wet lime, 5 bushels, to be mixed well together, and to remain for a week to act upon each other—after which work up with this mixture the following substances, viz.—Wood-ash charcoal, 20 bushels (see page 67)—Sulphate of soda, ½ cwt.—Sulphate of ammonia, 1 cwt.—Sulphate of magnesia, ½ cwt.—Peat or Saw dust, 1 ton—Coal tar and gas water, 20 gallons.

Another.

Saw dust, 40 bushels—Potash,* mixed with lime 14 months before, 10 bushels—Common salt, 168 lbs.—Sulphate of ammonia, 1 cwt.—Sulphate of soda, 56 lbs.—Sulphate of magnesia, 56 lbs.—Coal tar and gas water, 20 gallons.—Mix them well together.

Turn the mixtures repeatedly over—keep them dry—and allowing them to ferment one month, apply either of them to one acre of potatoes as follows—Strinkle one half underneath the sets, the other half above them, interposing a thin layer of earth, and cover up as usual.

MANGEL WURZEL.

Seed sown or dibbled, from 3 to 5 lbs. per acre.

TIME OF SOWING, *from the middle of April to early in May, on no account later.*
 DISTANCE OF ROWS, *about 27 inches—of plants in the row, about 12 inches.* DEPTH OF SEED, *one inch and a half.* AVERAGE PRODUCE, *from 25 to 30 tons of roots—nutritive value supposed to be about one-third greater than that of Swede turnips.*

REMARKS.

This being a cleaning crop may come between grain crops, and when a change in the rotation is desirable, may be substituted for turnips; but, as its exhausting power is considerable, the crop which follows it will probably require manuring. A warm moist climate is the most suitable for this plant; and a loamy soil—a little given to clay—but not too stiff, is the most favourable to its growth, while its leaves are less liable, than those of the turnip, to be attacked by the fly. The soil should be turned over and the subsoil moved, but not much displaced, before winter, and well pulverized; or in spring sufficiently early to be mellowed by frost. The sowing of the seed may be in drills upon the level where the soil is deep and light—where shallow and heavy upon raised ridges. Let the manure be placed under the drills, and the seeds scattered by hand therein; or dibbled, at the distance from each other above stated, dropping two or three into each hole. When the shoots are about the thickness of a quill, let them be carefully hoed, and singled by hand with the greatest nicety, supplying the vacancies in the rows by transplanting the largest of the supernumerary ones. As the roots reach their full growth, the leaves may be removed for cattle food, but not before.

The Beet crop, roots only, withdraws from the soil per acre,—

Potash, 493 lbs.; Soda, 1059 lbs.; Lime, 95 lbs.; Magnesia, 46 lbs.; Silica, 35 lbs.; Alumina, 7 lbs.; Oxide of Iron, 19 lbs.; Oxide of Manganese, 17 lbs.; Phosphoric acid, 56 lbs.; Sulphuric acid, 41 lbs.; Chlorine, 127 lbs.

Articles likely to furnish the above ingredients,—

It appears, that of this crop, even the roots themselves extract many of the above elements in large quantities, and therefore that a plentiful supply of animal manure will be required for furnishing nitrogen, and the other general ingredients.

* "The potash compost," see page 71, will be well adapted for this purpose—on mixing it with a further quantity of potash and with lime.

May.

Week commencing Monday, May the 13th, 1844.

Sussex.

MONDAY—*Willingdon School.* Boys digging and manuring ground for swede turnips, setting potatoes after tares. *Eastdean School.* Boys digging and manuring ground for carrots, hoeing tares, and gathering roots and weeds. *Piper.* Emptying the tank, and mixing liquid with ashes, using this mixture for turnips; *the fly has never meddled with them.* *Dumbrell.* Planting potatoes.

TUESDAY—*Willingdon School.* The same as yesterday. *Eastdean School.* Boys digging, planting potatoes, hoeing forward ones, and tares, collecting roots and weeds. *Piper.* The same as yesterday. *Dumbrell.* Setting potatoes, and digging.

WEDNESDAY—*Willingdon School.* Boys digging and manuring for swedes. *Eastdean School.* Boys digging and dibbling mangel wurzel, pouring tank liquid along the drills. *Piper.* Sowing turnips; doing it in *June* will not answer at Beachy-head, whatever it may do in a richer soil. *Dumbrell.* Digging.

THURSDAY—*Willingdon School.* Boys digging, &c., for swedes. *Eastdean School.* Preparing ground for turnips, hoeing tares, and putting chalk among the tares and wheat. *Piper.* Cleaning pigery; their urine probably a preventative against the attack of the fly. *Dumbrell.* Digging.

FRIDAY—*Willingdon School.* Boys digging, &c., for swedes. *Eastdean School.* Boys preparing for turnips, rolling the barley, sorting potatoes, and housing them. *Piper.* Sowing turnips. *Dumbrell.* Digging.

SATURDAY—*Willingdon School.* Boys breaking clods, the ground very dry. *Eastdean School.* Boys digging, and sowing garden with lucerne seed, manuring with tank liquid. *Piper.* Seeking about for mould, planting cabbages, earthing up beans. *Dumbrell.* Digging.

Worshshire.

Operations during the Week.

**Slaithwaite Tenants.* John Bamford. Cleaning about, and conveying roots to mix with tank liquid.

COW-FEEDING.

Willingdon School. Cows stall-fed on winter tares and green clover. *Dumbrell's.* Two cows fed in the stall with Italian rye grass, afterwards grazed in the pasture, and fed morn and even with Italian rye grass. Heifer stall-fed with potatoes and hay.

LUCERNE.

April.

This is in exact conformity with experience, the usual quantity of farm manure found necessary being at least equal to that required by swede turnips, viz.—from 10 to 15 tons per acre. But it is very evident that the urine of cattle ought to be made use of in great abundance, to give that large quantity of alkaline matter, *soda* in particular, required by this crop, and which, with *potash*, appear to be the *leading ingredients* it extracts from the ground.—Common salt to give *Chlorine*—Bones finely ground, or in solution, to give *Phosphoric acid*—Gypsum, to give *Sulphuric acid and Lime*—Sulphates of Potash, Soda, and Magnesia, to give *Sulphuric acid, Potash, Soda, and Magnesia*.—Those, or their component parts, should be present in the manure we apply to the beet or mangel wurzel crop.

LUCERNE.

Seed sown, broadcast, from 14 to 18lbs.—in drills, from 10 to 12lbs. per acre.

TIME OF SOWING, from the middle of April to the middle of May. DISTANCE OF ROWS, 10 or 12 inches. DEPTH OF SEED, not exceeding two inches. PRODUCE, "The collective cuttings, when made into hay, have been known to yield four tons."

REMARKS.

Lucerne seed, like the seeds of the clovers and grasses, may be sown broadcast with a corn crop, and the herbage, after supplying green food for several years, may be followed by similar crops. As lucerne, however, requires hoeing from time to time, in the most complete manner, sowing the seed in drills is preferable; and it should, if possible, be sowed alone, and follow after a summer fallow, or fallow crop. The soil best adapted to lucerne is one of a friable kind, rich, light, deep, of a loamy nature, and of an open texture. It refuses to grow when the subsoil is impervious and undrained, and will not thrive upon clay soil. In preparing the ground; before winter, or in early spring, turn over the soil with a fork whose prongs are 16 inches long, moving at the same time, but not displacing, the subsoil; then form drills on the level, at the distance, and of the depth, above-mentioned, strew the seed by hand, or scatter it along the drills from a dry wine bottle, through a quill open at both ends, passing through a cork fixed into its neck, and cover in by bush harrowing. After a fallow crop no manure will be required—after a corn crop, of course, the land must be well manured with yard dung. In the following January, February, or March, a top-dressing of manure, in either case, will be necessary. This crop, where it can be grown, will prove most useful for soiling, the great secret, in promoting its growth, is to keep it free from weeds; when sown broadcast, by harrowing them out—when in drills, by the most perfect hoeing.

Lucerne (green) withdraws from the soil per acre,—

Potash, 72lbs.; Soda, 33lbs.; Lime, 26lbs.; Magnesia, 19lbs.; Silica, 18lbs.; Alumina, 1½lbs.; Oxide of Iron, 1½lbs.; Sulphuric acid, 22lbs.; Phosphoric acid, 70½lbs.; Chlorine, 17lbs.

Articles likely to furnish the above ingredients,—

We observe that three *leading ingredients* are withdrawn from the soil by *Lucerne*, viz. *Lime, Sulphuric acid, and Phosphoric acid*, and we may from hence infer that the other matters being withdrawn in limited quantities, a moderate dressing only of yard manure will be required to give *Nitrogen* and furnish them, but that gypsum—bone dust—bone solution—guano, or substances containing *Lime, Sulphuric acid, and Phosphoric acid*, must be present, in order that the crop may serve itself with those bodies.

May.

Week commencing Monday, May the 20th, 1844.

Sussex.

MONDAY—*Willingdon School.* Boys digging, and manuring for swede turnips. *Eastdean School.* Boys digging, and sowing turnips, chopping clods, gathering weeds and stones. *Piper.* Hoeing between potatoe rows. *Dumbrell.* Digging.

TUESDAY—*Willingdon School.* Boys digging, and manuring for swede turnips. *Eastdean School.* Boys digging, and sowing turnips, hoeing forward potatoes and tares, gathering weeds, and weeding parsnips. *Piper.* Hoeing between potatoe rows. *Dumbrell.* Digging.

WEDNESDAY—*Willingdon School.* Boys pulling thistles from the wheat. *Eastdean School.* Boys cleaning the piggery, and pouring tank liquid from it along the drills of mangel wurzel and carrots. *Piper.* Hoeing onions, but not very deep; *they love a clayey but rich soil.* *Dumbrell.* Digging, wheeling out manure and spreading.

THURSDAY—*Willingdon School.* Boys hoeing wheat. *Eastdean School.* Boys digging, and sowing lucerne, watering it, turning dung and mould, hoeing potatoes, preserving the weeds. *Piper.* Keeping his hoe at work continually. *Dumbrell.* Gathering and burning rubbish for the ashes, sowing turnips.

FRIDAY—*Willingdon School.* Boys and self hoeing wheat. *Eastdean School.* Boys digging, chopping clods, sowing turnips, rolling and watering. *Piper.* Setting potatoes, and damping the rows, puts in a little tank liquid, and covers up. *Dumbrell.* Digging, drilling tares.

SATURDAY—*Willingdon School.* Boys emptying tanks, and cleaning up for Whitsuntide. *Eastdean School.* Boys emptying tanks, and portable pails, rolling tares, hoeing potatoes, cleaning school. *Piper.* Hoeing potatoes. *Dumbrell.* Gathering and burning rubbish for ashes to manure his turnips with.

Yorkshire.

Operations during the Week.

Slaitthwaite Tenants. *James Bamford.* Sowing swede turnips, planting potatoes, preparing ground for tares. *John Bamford.* Earthing cabbages, &c.

COW-FEEDING.

Willingdon School. Cows stall fed on tares.

Piper's. Cows are stall-fed with tares and lucerne, and doing well.

Dumbrell's. Two cows grazed in the pasture, and stall-fed more and even with Italian rye-grass. Heifer stall-fed with potatoes and rye

TURNIPS.

April.

TURNIPS.

Seed sown, broadcast, about 2½ lbs.—4n drills, 2lbs. per acre.

TIME OF SOWING,* *Swedes, from the beginning of April to the end of May, not later—Yellow sorts, some time afterwards—White Turnips, from the middle of May to the end of June, not later. DISTANCE OF ROWS,† Yellow and White Turnips, varying from 24 to 27 inches.—Swedes about 27 inches—of plants in the row, about 12 inches. DEPTH OF SRED, about 1½ inch. USUAL PRODUCE, White and Yellow Turnips, from 25 to 30 tons of roots—Swedes, a few tons less. MEM. And sometimes much heavier crops, but more frequently less.*

REMARKS.

A grain crop concluding the rotation is generally followed by turnips, but sometimes by other roots, which are succeeded in most cases by barley. The soil best adapted to turnips, is of a dry bottomed free nature, of good depth and fertility, light, dry and friable, and exclusive of heavy clay—or, what may be properly termed, good arable land. "Swedes, however, require deeper soil, richer land, more manure, and more air, than white turnips."‡ *Mr. Almack.* The ground having been prepared and thrown into ridges before winter, or at the usual time, (see "ridge following," page 49) and the manure deposited in the furrows in the manner there described, let the mixture intended to strengthen the yard manure be strewed equally over it, by hand, or in some other mode; the ridges having been split, and the fresh earth drawn over the whole, the sowing may then take place. But whether we sow upon raised ridges, on the level,§ or broadcast, the seed should be placed in near contiguity with such manure and its auxiliaries.

* *Time of Sowing, &c.*—"As a general rule, turnips may with advantage be sown at an earlier period in the north, than would be suitable for the same species, with other circumstances equal, in the south of England. In the East Riding of Yorkshire, it is common to commence sowing swedes the *second week in May*, and finish white turnips by the 21st of June. In Suffolk, it is usual to commence sowing swedes near the end of *May*, and white turnips a month later; the effect, however, of difference in latitude, is partially counteracted by a greater or less degree of elevation, as well as by a difference of soils where other things are equal."—*Mr. Almack.*

† *White Turnips.*—"Although as a general rule they do not require so much space as swedes—this does not apply to all species of them. Some species of turnips have larger tops than others, and some soils will, from the same seed, grow larger tops than others; different manures also, have each their peculiar effect in this respect. *The larger the top of the turnip is likely to be from the nature of the soil,* the greater will be the space requisite for bringing the bulb to perfection. It is also necessary to bear in mind the particular purpose for which the crop is wanted; for, where turnips are intended to be drawn off for cattle, it may be desirable to have them larger, than when for consumption on the land by sheep. Wide rows are certainly better to clean, but the most profitable mode, in any given situation, can only be ascertained by a full and careful consideration of all its peculiar circumstances."—*Ibid.*

‡ From observing that swedes are never good near hedges, although the land is richest there, and produces the heaviest crops of white turnips, *Mr. Almack* assumes that swedes require more air than white turnips, and that the latter only should be sown near hedges.

§ "*Swede Turnips* are usually sown in ridges, 27 inches apart, but when the soil is of such a nature as to make the crop peculiarly liable to injury from drought, some prefer the level system even for swedes."—*Mr. Almack.*

May.

Week commencing Monday, May the 27th, 1844.

Sussex.

MONDAY—*Willingdon School*. Boys have a week's holiday, master weeding potatoes. *Eastdean School*. Boys digging, and sowing turnips, hoeing potatoes, watering carrots and cabbages. *Piper*. Cleaning out the piggery, and mixing well the dung with mould. *Dumbrell*. Rolling fallow.

TUESDAY—*Willingdon School*. Master hoeing wheat. *Eastdean School*. Boys a holiday, myself mowing clover, and turning a mixen. *Piper*. Composting manure from the pigs with mould and plenty of liquid manure. *Dumbrell*. Wheeling out manure, spreading it.

WEDNESDAY—*Willingdon School*. Master hoeing wheat. *Eastdean School*. Boys digging, and sowing turnips, hoeing carrots, and parsnips, watering them, gathering roots and stones. *Piper*. Planting potatoes. *Dumbrell*. Sowing turnips, and rolling them.

THURSDAY—*Willingdon School*. Master earthing up potatoes. *Eastdean School*. Boys emptying tank, digging, watering ground, and planting cabbages, hoeing potatoes. *Piper*. Planting potatoes, and beans. *Dumbrell*. Wheeling out, and spreading manure.

FRIDAY—*Willingdon School*. Master earthing up potatoes. *Eastdean School*. Boys turning clover, hoeing potatoes, gathering weeds, weeding tares and oats, taking weeds to the pigs. *Piper*. Hoeing carrots. *Dumbrell*. Sowing turnips, and rolling them in.

SATURDAY—*Willingdon School*. Master digging tare ground for potatoes. *Eastdean School*. Turning up mould, emptying privy palls upon it, cleaning piggery and school room, watering lucerne. *Piper*. Hoeing onions. *Dumbrell*. Paring off clover stems.

Yorkshire.

Operations during the Week.

Slaithwaite School. Eleven boys, at their afternoon labour, preparing ground for turnips, harrowing, drilling, and sowing turnips, hacking up and gathering roots. *John Bamford*. Earthing cabbages, digging between potatoe rows.

COW-FEEDING.

Willingdon School. Cows stall-fed with tares and clover.

Dumbrell's. Two cows grazed in the pasture during the day, stall-fed morn and even with Italian rye grass. Heifer stall-fed with tares and rye.

Slaithwaite School. Cow fed in the stall with tares and rye.

TURNIPS CONTINUED.

The Swede Turnip crop, roots only, withdrawn from the soil per acre,—

Potash, 1060lbs.; Soda, 465lbs.; Lime, 334lbs.; Magnesia, 113lbs.; Silica, 190lbs.; Alumina, 16lbs.; Oxide of Iron, 14lbs.; Sulphuric acid, 356lbs.; Phosphoric acid, 163lbs.; Chlorine, 107lbs.

The White Turnip crop, roots only, withdrawn from the soil per acre,—

Potash, 53½lbs.; Soda, 65lbs.; Lime, 63½lbs.; Magnesia, 11lbs.; Silica, 20lbs.; Alumina, 4lbs.; Oxide of Iron, 1lb.; Oxide of Manganese, 1lb.; Sulphuric acid, 20½lbs.; Phosphoric acid, 37lbs.; Chlorine, 11½lbs.

From the above analysis it appears that the exhausting power of the swede, compared with the common turnip, is much greater, and this fact common experience, in accordance with theory, is found to affirm. Both kinds will require much farm yard manure, in order that they may receive a full supply of *nitrogen*. But, in addition to this, the swede must be furnished with substances from which it may extract a large quantity of fixed ingredients. The enormous quantity of *potash* taken out of the soil by this plant must be noted, and manures containing it in abundance must be present. Nitrate of potash (*saltpetre*) will give to the plant *nitrogen* and *potash*. The straw, particularly oat and bean straw, in yard manure, will give a considerable quantity of *potash*. Common salt will give *chlorine* and *soda*. Knottingley lime will give *lime* and *magnesia*. Gypsum will give *sulphuric acid* and *lime*. Bones will give *phosphoric acid* and *lime*. Copperas (*green vitriol*) will give *sulphuric acid* and *oxide of iron*. While *silica*, or the basis of flint or sandstone, and *alumina*, or the basis of clay, are, in general, already present in the soil in sufficient quantities.

Mixtures used to strengthen yard dung for one acre of turnips.

* * In applying the following mixtures estimate their cost, and reduce the usual quantity of farm manure in that proportion. Try to find out what is most wanted by the crop; it will often be found that those substances which have not been employed before, for some time, will answer best.

MIXTURE No. 1.

Home made or Domestic Guano.—Two bushels of bones dissolved, and mixed up with much night-soil, coal ashes, &c., and slowly dried,* (see pages 63 and 65.)

No. 2.

Native Guano.—Two cwt. of *guano*, beaten to a fine powder, with 16 bushels of wood ashes, or with half a ton of coal ashes, mixed all well together, and passed repeatedly through a sieve.

Scatter either of the above mixtures upon the manure when placed in the furrow.

No. 3.

Bone Dust.—Drill four cwt. of bone dust with the seed, over the manure.

No. 4.

Rape Dust.—Let six bushels be drilled near, but not in contact with, the seed, and over the manure.

* *Bone Solution.*—The application of bone solution, diluted with much water, has been tried alone as a substitute of yard manure, in many and different parts of this country. I have been kindly presented by R. W. PURCHAS, of Chepstow, in Monmouthshire, with a treatise giving an account of his own experiments, and a summary of many experiments made by others, which clearly establishes the fact, that this manure is of extraordinary value. Without acquiescing entirely with M. LIEBIG, that 40lbs. of bones so decomposed, will be sufficient for an acre of turnips, we must acknowledge that the experiments of the DUKE OF RICHMOND, Mr. LAWS, Mr. PURCHAS, and others, prove in the most decisive manner, that from three to four bushels of dissolved bones, applied in the liquid form, have produced better crops than a full dressing of farm manure, or bone dust.

June.

Week commencing Monday, June the 3rd, 1844.

Sussex.

MONDAY—*Willingdon School*. Boys digging, and manuring for potatoes after tares. *Eastdean School*. Boys digging, sowing turnips, watering them with liquid manure, planting potatoes and cabbages for winter. *Piper*. Hoeing amongst the potatoes. *Dumbrell*. Weeding oats.

TUESDAY—*Willingdon School*. Boys digging, manuring, and planting potatoes after tares. *Eastdean School*. Boys rolling barley and oats, weeding peas, hoeing potatoes and carrots, sowing the garden with lucerne. *Piper*. Setting potatoes. *Dumbrell*. Weeding tares, paring off clover stems.

WEDNESDAY—*Willingdon School*. Boys planting potatoes after tares. *Eastdean School*. Boys emptying pails, and mixing the contents with mould, weeding tares, and getting forward potatoes. *Piper*. Hoeing and mending lucerne; had but one slight shower of rain this three months at Eastdean. *Dumbrell*. Paring clover stems, burning, and digging.

THURSDAY—*Willingdon School*. Boys planting potatoes. *Eastdean School*. Boys digging, planting potatoes, planting cabbages after rye, and mending with liquid. *Piper*. Digging where the tares grew, and setting potatoes. *Dumbrell*. Paring clover stems off, digging.

FRIDAY—*Willingdon School*. Boys digging the second time for turnips. *Eastdean School*. Boys sowing turnips between the carrots, transplanting turnips, hoeing mangel wurzel, weeding oats and barley. *Piper*. Setting potatoes. *Dumbrell*. Paring clover stems off, digging, and spreading ashes.

SATURDAY—*Willingdon School*. Boys digging the second time for turnips. *Eastdean School*. Boys hoeing potatoes, cleaning out piggery, pails, and school-room. *Piper*. Emptying the tank, and mixing liquid with dung and mould. *Dumbrell*. Digging.

Wiltshire.

Operations during the Week.

Slaithwaite School. From nine to ten boys breaking sods, burning wicks, making a tank. *C. Varley*. Carrying manure, ridging for turnips, and sowing them. *James Bamford*. Sowing tares, preparing for turnips, earthing potatoes. *John Bamford*. Delving, liming cabbages.

COW-FEEDING.

Willingdon School. Cows fed on tares and clover.

Dumbrell's. Two cows grazed in the pasture the whole week, stall-fed morn and even on tares till Wednesday, afterwards with clover. Heifer stall-fed on tares.

Slaithwaite School. Cow stall-fed on rye and tares. *C. Varley's*. On mown grass.

HOING, WEEDING, &c.

May.

No. 5.

Artificial Mixture. One cwt. of gypsum; 30lbs. of sulphate of ammonia; 20lbs. of nitrate of soda; mix them, when reduced to a fine powder, well together, and scatter the mixture upon the manure.

No. 6.

Artificial Guano. Incorporate with the manure, or scatter above it, the mixture described at page 67—in weight 132½lbs.

No. 7.

Barochan Guano. Five cwt. of this mixture may also be used as above (see p. 67.)

BULBS AND LEAVES OF SWEDE TURNIPS COMPARED.

From recent experiments of Professor JOHNSTONE, it appears that:—

Bulbs of Swedes contain 88 per cent. of water.

Tops of Do. " 85 " "

1st—"A ton of bulbs contain 1,970lbs. of water, and 270lbs. of dry matter.

A ton of leaves contain 1,900lbs. 340lbs.

Obs.—Or, the leaves contain, in the same weight, one-fourth more dry food than the bulbs.

2nd—"A ton of bulbs give 17lbs. of ashes.

A ton of leaves give 33lbs. of ashes.

Obs.—Or, the leaves, weight for weight, take from the soil twice as much as the bulbs.

3rd—"A ton of bulbs contain from 3 to 6lbs. of Phosphates.

A ton of leaves contain 10lbs. of Phosphates.

Which, entering largely into the composition of milk and bones, may cause a larger supply of milk when leaves are given than when bulbs, and be more nourishing food for young stock whose bones are forming."

"Where weeds grow, better things might grow, and we never hear of weeds paying rent."—*Anon.*

"Gentlewomen may do themselves much good by kneeling upon a cushion and weeding."—*Bacon.*

Hoing, Weeding, &c.—In May, June, and July, the spring sown crops, as they successively get into good braird, must be hoed, weeded, and earthed up in the most careful manner. Where the plants do not seem to spring into vigorous growth, various mixtures may be applied as top-dressings, with good effect in many, if not in all, cases. *Native guano* being a perfect manure, may be mixed with coal-ashes, and applied in almost every case with success, especially in a moist season, in the proportion of from one to three cwt. per acre. The *Domestic*, or *home made guano*, described p. 65, will be found very useful to crops in general, when applied alone, after the rate of four or five cwt, per acre, especially when it has been well charged with "*bone solution*." It may also be mixed, weight for weight, with the *strengtheners*, or saline substances below-mentioned, diminishing the quantity of them when it is used; but should you not have a supply of it, they may, when beaten small, be used alone; or, what is better, mixed up with several times their bulk of well sifted coal-ashes, or wood-ash charcoal, p. 67.

June.

Week commencing Monday, June the 10th, 1844.

Sussex.

MONDAY—*Willingdon School*. Boys digging for potatoes after tares. *Eastdean School*. Boys digging, sowing white turnips, watering, picking off weeds and stones. *Piper*. Gathering flints. *Dumbrell*. Digging, spreading ashes, sowing turnips, and mixing dung and mould.

TUESDAY—*Willingdon School*. Boys digging for potatoes, and turnips after tares. *Eastdean School*. Boys hoeing potatoes, gathering weeds for the pigs, turning over a mixen for wheat. *Piper*. Hoeing carrots. *Dumbrell*. Digging up tare ground, hoeing carrots.

WEDNESDAY—*Willingdon School*. Boys digging for turnips and potatoes after tares. *Eastdean School*. Boys emptying privy pails, nipping the blossom from potatoes, and thinning carrots. *Piper*. Drawing litter to the piggery, and mixing it with mould. *Dumbrell*. Mixing dung and mould.

THURSDAY—*Willingdon School*. Boys planting potatoes. *Eastdean School*. Boys digging between potatoes, hoeing forward turnips, planting and manuring cabbages for winter. *Piper*. Turning the mixen. *Dumbrell*. Digging up tare ground, manuring and hoeing carrots.

FRIDAY—*Willingdon School*. Boys earthing up potatoes. *Eastdean School*. Boys weeding wheat and oats, hoeing peas, and pouring tank liquid between the drills. *Piper*. Hoeing potatoes. *Dumbrell*. Digging up tare ground, and hoeing carrots.

SATURDAY—*Willingdon School*. Boys emptying the tanks. *Eastdean School*. Boys cleaning piggery and pails, watering carrots, and cleaning up. *Piper*. Hoeing onions. *Dumbrell*. Mowing clover for hay.

Yorkshire.

Operations during the Week.

Slaithmaite Tenants. From ten to twelve boys drilling turnips, sowing broadcast, digging the tare ground, have planted 300 cabbages and watered them; with twelve rows of turnips. *C. Varley*. Manuring for and sowing turnips, mixing peat earth with manure.

COW-FEEDING.

Willingdon School. Cows fed in the stall on tares and clover. *Dumbrell's*. Two cows stall-fed with clover.

MIXTURES AS TOP-DRESSINGS : DOUBLE, OR STOLEN CROPS.

May.*Proper and approved mixtures for top-dressings,* per acre.**For Beans*—Nitrate of soda, 1½cwt.—Sulphate of soda, 1½cwt.—Gypsum, 2cwt.*For Peas*—Sulphate of soda, 2cwt.—Gypsum, 2cwt.

(?) When the crops have been carefully hoed and weeded, the salts having been previously reduced to powder and mixed with domestic guano, or coal-ashes, may be scattered between the rows, and the gypsum afterwards, upon and near the plants; and when a shower of rain has fallen, the earthing up may then be proceeded with.

For Carrots—Four or five cwt. of domestic guano, or two cwt. of native guano, may be applied before the roots are earthed up.

For Spring Wheat—The articles prescribed for winter wheat, see pages 87, and 89, may be used for this crop.

For Oats—Nitrate of soda, ½cwt.—Common salt, ½cwt.

For Barley—Native guano, from one to three cwt., mixed with an equal bulk of coal-ashes.

(?) The above substances may be scattered upon the crops of corn after the hoeing and weeding have been performed, and the rolling of them may then take place. When clover or grass seeds are to be sown, the dressing may be applied before the hoeing and weeding, after which the seeds may be put in, and rolling, or bush harrowing succeed, according to the nature of the soil.

DOUBLE, OR STOLEN CROPS.

After Rye, Rape, Tares, &c.—As soon as the ground becomes cleared of these crops for sowing purposes,† let them be replaced

* Observation by Mr. GARDINER, "From what has been observed, both in this and former seasons, all dressings and manures containing a large percentage of nitrogen, such as rape dust, sulphate and muriate of ammonia, nitrate of soda, &c. make the grain grown by them, lighter in weight per bushel, while at the same time, they give more bushels per acre as well as more straw. On the other hand, such dressings and manures as common salt, sulphates of soda and magnesia, and bone dust, invariably give heavier grain per bushel, but fewer bushels per acre. Now it appears from this, if the same be found good in other places, that the most judicious and economical method is to use a mixture of these, as common salt with nitrate of soda, or any of the others. The one will give quantity the other weight; because not one of the dressings enumerated above, except guano, contain all the ingredients required for the food of plants."

* For general purposes.—Mr. HARRISON recommends (see *Far. Mag.* for October, 1845) the following compost—one bushel of salt, two bushels of lime, to be mixed together, breaking the large knobs of lime, and turning over the heap frequently. He directs us to apply 14 or 16 bushels of this mixture, per acre, as a top-dressing to wheat and turnips immediately after the sowing. He says, "No farmer ought ever to be without a good stock of prepared lime and salt. Time will not injure it, and with this mixture crops may at all times be improved, and strength and beauty added to the straw." The refuse lime of the gas works would be very proper for such a purpose.

† About the end of June, 1845, the cutting of a small field of rye, for green food, was completed; the weight of which averaged about eight tons per acre. Without further care the stubble was left to shoot again into braird and to produce corn. Although the reaping of the crop was late in consequence of the very unfavourable season, the straw and grain have turned out of average quantity. From this experiment, made in a very elevated, bleak situation, and on a poor soil, coupled with other reasons, I am of opinion that by giving a good dressing of liquid manure after the first cutting—as we do to Italian rye-grass—that either winter rye or tares, if allowed to stand, would produce a good second crop of green food, or an average weight of seed.

June.

Week commencing Monday, June the 17th, 1844.

Sussex.

MONDAY—*Willingdon School*. Boys sowing white turnips where the mangel wurzel missed. *Eastdean School*. Boys mowing clover for hay, digging between and earthing potatoes, and nipping off the blossoms. *Piper*. Hoeing potatoes. *Dumbrell*. Cutting up tare stubble to put in the pig-pound.

TUESDAY—*Willingdon School*. Boys sowing white turnips as yesterday. *Eastdean School*. Boys hoeing forward turnips, transplanting some, and preparing ground for cabbage. *Piper*. Driving mould to the mixen. *Dumbrell*. Digging up tare ground, and planting cabbages.

WEDNESDAY—*Willingdon School*. Boys hoeing among the potatoes. *Eastdean School*. Boys emptying pails, planting cabbages, and pouring tank liquid around them. *Piper*. Emptying the tank liquid on the mixen. *Dumbrell*. Hoeing potatoes, and digging rye grass.

THURSDAY—*Willingdon School*. Boys digging for white turnips. *Eastdean School*. Boys turning clover, hoeing mangel wurzel and potatoes, and picking blossom. *Piper*. Digging up tare ground, and pouring all the liquid I can get upon it. *Dumbrell*. Hoeing potatoes, and digging up rye grass.

FRIDAY—*Willingdon School*. Boys hoeing and weeding carrots. *Eastdean School*. Boys carrying clover hay, digging between the carrot rows, and picking weeds. *Piper*. Digging tare ground, and sowing turnips. *Dumbrell*. Cutting up tare stubble, stacking hay.

SATURDAY—*Willingdon School*. Boys hoeing and weeding carrots. *Eastdean School*. Boys thatching the hay-rick, cleaning out pails and piggery. *Piper*. Hoeing potatoes. *Dumbrell*. Digging up rye-grass.

Wiltshire.

Operations during the Week.

Slaithwaite School. Boys preparing rye and tare stubble, planting 1500 cabbages, digging, breaking clods, gathering roots. *C. Varley*. Weeding and hoeing potatoes, emptying tank, applying liquid to cabbages, emptying privy pails.

COW-FEEDING.

Willingdon School. Cows stall-fed on clover.

Piper's. Cows stall-fed on clover and lucerne, doing well.

Dumbrell's. Two cows stall-fed with tares.

Slaithwaite School. Cows stall-fed with tares and rye. *C. Varley's*. Fed on mown grass.

BUCK-WHEAT, AND RAPE, AFTER RYE OR TARES.

June.

immediately by others of a different kind. Forage plants, particularly tares, possess so great a power of absorbing water, that they divest the earth over which they grow of all excessive moisture, and leave it so mellow and dry as to make its working a very easy task. The stubble of the former crop having been removed, let the soil be turned over, well pulverized, and reduced to as fine a tilth as possible, after which the sowing of grain, the planting of roots, or other esculent crops may follow. It is in double cropping that the field-gardener has a peculiar advantage, for in unsettled wet weather he can prepare his ground, using the spade, fork, and rake, when the plough cannot be used at all.

BUCK-WHEAT, AFTER RYE OR TARES.

Seed sown, always broadcast—for soiling, two bushels—for producing seed, five pecks, per acre.

TIME OF SOWING, for a crop to bear seed, about the end of May—for green food, until the second week in June, never later than Midsummer. PRODUCE, in grain, from 24 to 40 bushels per acre.

REMARKS.

"The value of this crop, which will grow on land that will produce nothing else, is little known. It serves as a capital change in a rotation of crops, and is more profitable than barley after very late turnips, to be followed by wheat," (vide *Farmer's Almanack*) for which it is an excellent preparative. When rye and tares are cut and removed early from the ground, let it be prepared as above directed, and receive a small dressing of light manure, such as the "field-compost" described p. 73; the seed may then be sown broadcast, and harrowed in, but not rolled, after which the crop will require no further care, and under its shade all weeds will be completely smothered. Cut green, it is excellent forage for pigs and cows, increasing the quantity, and improving the quality of milk and butter. The flour of its grain will form good bread, and may be made into a kind of cakes, whose taste will please even a delicate palate.*

Rape after early Rye or Tares.—In June, not later, on the crops being removed, break up a portion of the rye or tare ground, and when a light dressing of short manure or "field-compost," p. 73, has been harrowed in, sow rape seed broadcast, at the rate of one peck per acre, and repeat the harrowing twice. You may thus provide a supply of green food in the fall when it will be most wanted, and still be in time for sowing winter wheat. Of all green crops, *rape* appears to be the most valuable for soiling purposes, and where it has been tried, has given great satisfaction, and in this neighbourhood is likely to become extensively adopted as fodder for milking kine.

* *Buck-Wheat Cakes.*—The following method of making these cakes is extracted from *Vancouver's Hampshire*, p. 174, and is one that I have frequently seen practised in North America. "The flour is mixed up, over-night, with yeast and water, this being kept warm during the night, rises by morning to a light and frothy consistence, or batter; small portions of which are spread upon a flat iron, or griddle, suspended over the fire, or placed upon a trivet, which is slightly rubbed over with hog's lard between the baking of each cake. The bread is very light, and the cakes, which resemble our crumpets, are eaten hot with butter, and are almost universally served up to every breakfast table."

June.

Week commencing Monday, June the 24th, 1844.

Sussex.

MONDAY—*Willingdon School*. Boys rolling and harrowing ground for swede turnips; a little shower. *Eastdean School*. Boys hoeing potatoes, and turnips, gathering weeds from the rows for the pigs. *Piper*. Digging tare ground. *Dumbrell*. Thatching hay-stack.

TUESDAY—*Willingdon School*. Boys drilling in swede turnip seed. *Eastdean School*. Boys hoeing, digging, gathering roots and stones, breaking clods. *Piper*. Cleaning piggery, removing dung to the mixen. *Dumbrell*. Digging and drilling turnips, watering, gathering tare stubble for the cows to lie upon.

WEDNESDAY—*Willingdon School*. Boys drilling swede turnip seed. *Eastdean School*. Boys digging, mixing tank liquid with mould, and putting it into the drills, and sowing white turnips. *Piper*. Turning the mixen. *Dumbrell*. Digging, drilling turnips, watering, collecting stubble for cows to lie upon.

THURSDAY—*Willingdon School*. Boys doing the same as yesterday; another little shower. *Eastdean School*. Boys digging, planting cabbages, bearing manure, and watering them. *Piper*. Digging tare ground. *Dumbrell*. Digging tare ground, cutting off turnip seed pods.

FRIDAY—*Willingdon School*. Boys digging in swedes. *Eastdean School*. Boys planting and manuring cabbages. *Piper*. Digging. *Dumbrell*. Digging up tare ground.

SATURDAY—*Willingdon School*. Boys sowing white turnips, on failure of mangel wurzel crop. *Eastdean School*. Boys planting cabbages, weeding lucerne, cleaning pails, piggery, and school-room. *Piper*. Hoeing potatoes, *studying* how to get manure for next wheat season. *Dumbrell*. Wheeling out manure, sowing turnip seed in the tare ground for second crop.

Worckshire.

Operations during the Week.

Slaithwaite School. Ten boys digging up tare ground, gathering roots. *C. Varley*. Preparing ground for cabbages, manuring for swede turnips, digging, transplanting swedes, earthing potatoes.

COW-FEEDING.

Willingdon School. Cows stall-fed on tares and clover.

Dumbrell's. Two cows stall-fed with tares.

Slaithwaite School. Cows stall-fed on tares and rye.

C. Varley's. Cows stall fed on peas and grass.

ROOT CROPS, ITALIAN RYE-GRASS, CABBAGES, RAPE, RIDGE FALLOWING, AFTER TARES, &c.

June.

Potatoes, Turnips, Mangel Wurzel, after early cut Rye, Rape, or Tares.—When the rye, rape, and tare ground can be broken, ridged up, and got ready in proper time. The ridges having been formed, place the stubble roots in the intervening furrows, above which spread the manure, and scatter over it such hand tillages as may be likely to benefit the intended crop; and splitting the ridges, let the whole be covered up. You may then dibble potatoes, or put in mangel wurzel, swede, or common turnip seed, immediately over the manure; potatoes, swede turnip, or mangel wurzel not later, in Yorkshire, than the middle of May; turnip seed by the first of June.

Planting Cabbages, Kohl-Rabi, and Swede Turnips, after Winter and Spring Tares.—As the different successions of tares are being removed let the ground be prepared for other crops. Transplant cabbages, placing them in rows, upon the level, according to the directions given at pages 41 and 83, in all May, June, July, and August. Transplant swedes, and a few Kohl-Rabi shoots, from the April seed bed, upon raised ridglets, enclosing the manure and auxiliaries usually given to these vegetables, but not much later in the North of England, than the middle of June.

Rape Seed Bed.—In June, dig up a small portion of the tare plot, in a sunny but well sheltered corner, manure it with "field compost," and sow rape seed broadcast, cover with fresh earth to the thickness of one inch, and as the shoots rise, thin them out to a proper distance, they will be ready for transplanting in September—see p. 27.

ITALIAN RYE-GRASS AFTER LATE TARES.

Seed sown, broadcast, four bushels per acre.

TIME OF SOWING, after Tares, in August and September.

REMARKS.

Italian rye-grass is usually raised under the shade of corn, like clover. But is much better fitted to stand alone, and to follow early corn or spring tares. The tare ground having been broken up, well manured, and pulverized, and all weeds removed, the seed may be sown broadcast, and lightly harrowed in. But as the varieties and qualities differ much, the seed ought to be grown, if possible, at home, and its value tested. The young grass must be well weeded; and when it is cut in the following spring, as well as after every future cutting, the eddish must be watered with liquid manure from the tank. When this grass takes to flourish, it will be found most valuable for forage. In some instances it has been cut five or six times in the year, giving each time a very abundant crop.

Rape after late Tares.—In August, or early in September, on the removal of late spring tares, prepare the ground, and sow rape as before directed, to stand, uncut, over winter, come round early for green food in the following spring, and then to be followed by turnips. Let manure be liberally applied with the seed, to succour and sustain the tender shoots during winter.

Ridge fallowing after the latest crop of tares.—Of all plants the tare prepares the ground best for "ridge fallowing." The tare ground may be broken up, well harrowed, and ridged up in the manner described in the article "ridge fallowing," p. 49. The forking over of the ridges and subsoiling as there suggested, may be effected late in the fall, or, in winter, during intervals of fair, open weather.

July.

Week commencing Monday, July the 1st, 1844.

Sussex.

MONDAY—*Willingdon School*. Boys digging, and manuring with tank liquid for white turnips after spring tares. *Eastdean School*. Boys digging, and planting cabbages, watering them, weeding and hoeing potatoes. *Piper*. Hoeing lucerne; hoe it deep. *Dumbrell*. Sowing soot and lime on the turnips, to drive away the fly, cutting up tare stubble.

TUESDAY—*Willingdon School*. Boys doing the same as yesterday. *Eastdean School*. Boys planting cabbages, manuring and watering, weeding mangel wurzel, cabbages and turnips. *Piper*. Applying tank liquid to the lucerne. *Dumbrell*. Cutting tare stubble for litter, planting cabbages.

WEDNESDAY—*Willingdon School*. Boys digging, and applying tank liquid for white turnips after tares. *Eastdean School*. Boys emptying pigstye tank, sowing rape and tares for green food, hoeing potatoes. *Piper*. Hoeing potatoes; remove the bloom as you go on. *Dumbrell*. Transplanting mangel wurzel, cutting up rye grass.

THURSDAY—*Willingdon School*. Boys sowing white turnips and harrowing. *Eastdean School*. Boys hoeing potatoes, nipping the blossoms from them, weeding oats, and barley. *Piper*. Hoeing potatoes; do not break or bruise the haulm. *Dumbrell*. Earthing up potatoes, transplanting parsnips.

FRIDAY—*Willingdon School*. Boys digging, and applying solid manure for white turnips after spring tares. *Eastdean School*. Copious rain, boys in the school or platting straw, and learning to make bee-hives. *Piper*. Digging tare ground. *Dumbrell*. Earthing up potatoes, transplanting mangel wurzel.

SATURDAY—*Willingdon School*. Boys earthing up potatoes. *Eastdean School*. Boys transplanting potatoes, sowing white turnip seed, cleaning out piggery, portable pails, and school-room. *Piper*. Same as before. *Dumbrell*. Hoeing carrots, digging up tare ground, digging up rye-grass.

Yorkshire.

Operations during the Week.

Slaithwaite Tenants. *C. Varley*. Sowing swede turnips, planting swedes, manuring for and planting turnips, mowing grass. *John Bamford*. Weeding and hoeing swede turnips, earthing potatoes, and planting swedes.

COW-FEEDING.

Willingdon School. Cows fed on tares in the stall.

Dumbrell's. Two cows stall-fed with tares till Friday, afterwards with clover.

C. Varley's. Stall-fed on peas and grass.

HOEING, EARTHING, WEEDING ROOT CROPS: TRANSPLANTING POTATO SHOOTS: TOP-DRESSING POTATOES.

June.

"The increase even of your children, will be an increase of your wealth, if you inure them early to diligence and labour; for the earth is inexhaustible, and will be more fruitful in proportion as it is cultivated by more hands; it will reward labour with boundless liberality."—*Fenelon*.

Hoeing, Earthing, Weeding root crops.—When you have a leisure moment in May, June, and July, the hack and hoe ought always to be in operation. As weeds spring up and crops come forward, the hoeing, weeding, earthing up, and, if necessary, the applying of top-dressing to them must not be delayed. Do not suffer a weed to live; seek for them every where; and let your children be always engaged in this most useful, healthy, and pleasant labour. As they assist you in weeding and hoeing turnips, cabbages, and carrots, and in adjusting plants to a proper distance, their shortness of stature will be found of advantage; at the same time they will learn an art, that cannot easily be forgotten.

Transplanting potato shoots.—When there are vacancies or intervals in your potato rows, proceed as follows. Carefully take up a few of the neighbouring sets by the fork, and removing all the shoots from each set, except one; restore that one and its single shoot to the place it was taken from, and carefully plant the remainder in a coiling form, in the intervals where the plants have failed, leaving only the top part of them above the soil. These shoots when properly planted will produce tubers.

"Saltpetre increases the vital action in man; it doth the same in plants."

Top dressing Potatoes.—After the vacancies in the rows have been filled up, the application of saline top-dressings will naturally commence. The following are mixtures for that purpose. They may be applied to the crop, when the plants are five or six inches high, by scattering them upon the ridges, previous to a shower of rain; after which the potatoes may be earthed.

For one acre of potatoes moderately manured when set.

No. 1.

Salt-petre, $\frac{1}{2}$ cwt.; sulphate of soda, $\frac{1}{2}$ cwt.; sulphate of magnesia, $\frac{1}{2}$ cwt.

No. 2.

Salt-petre, $\frac{1}{2}$ cwt.; gypsum, 1cwt.; salt, 1cwt.; sulphate of magnesia, $\frac{1}{2}$ cwt.

No. 3.

Nitrate of soda, $\frac{1}{2}$ cwt.; gypsum, 1cwt.; wood-ash charcoal, 30 bushels; salt-pan bitters, 20 gallons.*—*Vide Mr. Prideaux's Paper in the Farmer's Magazine.*

* Salt-pan bitters, at the salt works, 1 $\frac{1}{4}$ d. per gallon; sulphate of magnesia, 12s. per cwt.; nitrate of soda, £1 4s. per cwt.

July.

Week commencing Monday, July the 8th, 1844.

Sussex.

MONDAY—*Willingdon School*. Digging, and manuring with liquid for white turnips after spring tares. *Eastdean School*. Digging up tare stubble, planting, manuring, and watering cabbages. *Piper*. Taking up onions. *Dumbrell*. Hoeing carrots, cutting up rye grass.

TUESDAY—*Willingdon School*. The same as yesterday. *Eastdean School*. Boys digging up tare stubble, cutting up potatoes, weeding carrots, bringing weeds for the pigs. *Piper*. Taking up onions, removing them, and digging up the ground immediately. *Dumbrell*. Hoeing carrots, dibbling mangel wurzel, planting cabbages.

WEDNESDAY—*Willingdon School*. Boys digging, working among the potatoes. *Eastdean School*. Boys digging, and applying tank liquid, planting more cabbages, earthing up potatoes. *Piper*. Digging where the onions came off. *Dumbrell*. Hoeing carrots, digging up tare ground.

THURSDAY—*Willingdon School*. The same as yesterday. *Eastdean School*. Weeding lucerne, watering it, sowing white turnips, transplanting small ones. *Piper*. Hoeing carrots. *Dumbrell*. Digging up tare ground.

FRIDAY—*Willingdon School*. Boys doing the same as before. *Eastdean School*. Boys in school all day, can find nothing whatever for them to do. *Piper*. Hoeing carrots, am quite particular in removing all rubbish from them. *Dumbrell*. Wheeling manure, and sowing turnips on the tare ground.

SATURDAY—*Willingdon School*. Boys hoeing turnips. *Eastdean School*. Boys cleaning piggery, portable pails, school-room, and cutting tares for Sunday. *Piper*. Hoeing potatoes. *Dumbrell*. Hoeing potatoes, spreading tank liquid on the new mown clover.

Wiltshire.

Operations during the Week.

Slaitwaite Tenants. C. Varley. Hay making, digging up tare ground for wheat.

COW-FEEDING.

Willingdon School. Cows fed in the stall with the second cut clover. *Dumbrell's*. Two cows stall-fed with tares till Friday, afterwards with clover.

C. Varley's. Cows stall-fed on grass.

HOING TURNIPS AND MANGEL WURZEL : TRANSPLANTING SWEDE TURNIPS : CLIMATE.

July.

Hoeing Turnips and Mangel Wurzel.—The triangular hoe, made at Birmingham, having three cutting edges, is well adapted for hoeing these plants, and the corners well calculated for detaching and nicely picking them out. Do not leave these plants too near each other in the row; 12 or 14 inches distant will be near enough; for whoever reads the works of Mr. TULL, the father of drill husbandry, cannot fail, I think, to learn, that by doing so, the produce will be less in quantity and worse in quality. Hoe these crops early that the fly may be frightened away, but first scatter the top-dressings upon the rows, and, the hoe following, after a shower of rain has fallen, will introduce what remains upon the surface into the ground.

No. 1.

For a crop where yard manure and guano, or guano alone, was used.
Apply a dressing of 1½ cwt. of gypsum to the acre.

No. 2.

For a crop where domestic guano, or a mixture of natural guano and manure has been applied with the seed.

Apply nitrate of soda, 1½ cwt., mixed with 1 cwt. of gypsum.—or,
Sulphate of ammonia, 56 lbs.

No. 3.

For a crop where rape dust and manure were applied with the seed.
Apply ½ cwt. nitrate of soda mixed with 1 cwt. of gypsum.

The quantity of dung may be diminished in proportion to the value of the saline substances introduced before the seed, and in subsequent top-dressings. Let all dressings be well mixed with abundance of coal-ashes, and passed repeatedly through a sieve.

Transplanting Swede Turnips.—Fill up every interval in the ridges, or failing places, in the broadcast plot of turnips, with swede turnips or cabbage plants. The planting stick in every moment of leisure, must be in motion. In performing the operation, let holes be struck large enough to receive the roots of the plant freely; avoid all squeezing or doubling of their fibres; then, holding the stick aslant, keep its point directed to the root, and press the earth in perfect contact all around, until the plant resists a slight upward pull, and is firmly fixed.

“To every thing there is a season, and a time to every purpose under the sun.”—*Ecclesiastes.*

Climate of Sussex and Yorkshire compared.—By comparing the operations of the Sussex field-gardeners during winter, with those at Slaithwaite, it would, at first sight appear, that they living

July.

Week commencing Monday, July the 15th, 1844.

Sussex.

- MONDAY**—*Willingdon School*. Boys hoeing swede turnips, and weeding potatoes. *Eastdean School*. Boys digging, hoeing potatoes and turnips, nipping potato blossom, gathering weeds for the pigs. *Piper*. Planting cabbages, watering them well. *Dumbrell*. Hoeing potatoes, digging up rye grass.
- TUESDAY**—*Willingdon School*. The same as yesterday. *Eastdean School*. Boys digging, planting cabbages, watering them with tank liquid, sowing white turnips. *Piper*. Planting cabbages; don't use tank liquid before they get rooting. *Dumbrell*. Hoeing turnips, digging up tare ground.
- WEDNESDAY**—*Willingdon School*. The same as before. *Eastdean School*. Boys planting cabbages, and manuring them. *Piper*. Hoeing potatoes; always hoe twice. *Dumbrell*. Hoeing turnips, digging up tare ground.
- THURSDAY**—*Willingdon School*. Boys hoeing swede turnips, earthing potatoes. *Eastdean School*. Boys hoeing parsnips and carrots, thinning out the latter, bearing rejected plants and weeds to the cows and pigs. *Piper*. Hoeing turnips, bringing mould to the mixen. *Dumbrell*. Hoeing turnips and mangel wurzel, digging up rye grass.
- FRIDAY**—*Willingdon School*. Boys wheeling manure, part of the afternoon wet. *Eastdean School*. Wet weather, boys in school all day, or plating straw, spearing potatoes, or beehive making. *Piper*. Hoeing turnips. *Dumbrell*. Hoeing turnips, transplanting mangel wurzel, digging ground.
- SATURDAY**—*Willingdon School*. Boys earthing up potatoes. *Eastdean School*. Boys hoeing and transplanting turnips, watering cabbages, cleaning out piggery, portable pails, and school room, and turning dung mixen. *Piper*. Gathering dung under trees, where the cows stand to inhale the fresh breezes. *Dumbrell*. Hoeing turnips, applying tank liquid.

Yorkshire.

Operations during the Week.

Slaithwaite Tenants. John Bamford. Earthing cabbages, hoeing turnips, transplanting swedes to the vacancies on the sown ridges. *C. Varley*. Hoeing turnips, emptying tank, &c.,

COW-FEEDING.

Willingdon School. Cows stall-fed on the second cut of clover. *Dumbrell's*. Two cows stall-fed with clover and tares for four days; for two days upon rye grass and tares. *C. Varley's*. Cows stall-fed on tares, and small turnips.

SMALL FARMS.

"nearer the sun," to use a common phrase, have a decided advantage to those who live northward? But, on taking a closer view of the matter, we shall learn that the provisions of nature are very justly distributed. For, if the former are favoured with a more radiant sunlight, bringing to fuller maturity and earlier perfection their crops of corn, the latter have a longer continuance of it, with a climate more humid, and better calculated for the production of root crops, and succulent vegetables, attaining to larger size and yielding more support to the animals which become, in greater proportion, the food of the inhabitants of more northern countries. In Sussex it appears the out-door labours of the men were rarely interrupted, while at Slaithwaite they were nearly suspended by unfavourable weather. And when, during the month of January, the sowing of their early crops (peas, beans, &c.) had commenced in Sussex, no prospect of being enabled to sow any crop for some time to come, not even to prepare the ground for it, could be entertained by the Yorkshire cultivator. The inference, therefore, is obvious, that as our winter, in general, is severe, and protracted, every energy ought to be called forth, in the previous autumn, and directed to the preparation of the soil for all kind of root and other crops, intended to be sown early in the following spring; and that, taking advantage of the mellowing influence of frost, we should endeavour to make it perform part of our labour, and at a moment's warning, as soon in the spring as the weather is in the least favourable, be quite prepared to commit our seed to the ground.

Appendix.

SMALL FARMS.

"A vine dresser having two daughters and a vineyard; on the marriage of his eldest daughter, gave her a third of his vineyard for her portion, notwithstanding which, he had still the same quantity of fruit as formerly; when his youngest daughter was married he gave her half of what remained, and still the produce of the vineyard was not diminished."—*Columella, lib. iv. c. 3.*

In corroboration of this anecdote, Mrs. DAVIES GILBERT, in a letter, once stated to the author, "that from experience she had found that a farm of four acres, cultivated on the Belgian plan, might be made as profitable to an industrious tenant, as one of seven farmed under the old system. And in consequence of a ten acre farm having been found too large to be well cultivated by the spade, several farms of ten were reduced to five acres, and by thus concentrating the labours of the tenants, the change had proved decidedly advantageous to them."

CAPITAL REQUIRED : SPADE-HUSBANDRY.

CAPITAL REQUIRED FOR STOCKING A FARM OF FIVE ACRES.

As found by experience on Mrs. Gilbert's estates.

	£.	s.	d.
Seed wheat for two acres, 8 bushels, at 7s.	2	2	0
Clover seed, for one acre of wheat	0	10	0
Seed Rye and Tares, for Stall-feeding two cows	1	10	0
Seed Potatoes, for one acre	1	5	0
Seed Oats, for one acre	0	7	0
Swede Turnips and Mangel Wurzel seed, for half an acre	0	2	0
One young Sow	1	5	0
Two cows, to be stall-fed, at £9 each	18	0	0
For the man's subsistence till his cows come on	15	0	0

*Or in round numbers, £8 per acre.**£40 1 0*

ARGUMENTS IN FAVOUR OF SPADE-HUSBANDRY.

"Much good must arise—from a man depositing his labour on his land—and he who points out, how this labour may be made most productive—confers a great benefit on the great family of human life."—*Mr. Thynne.*

Dr. Yellowley's arguments.—"Spade husbandry is not a system of expense or risk. Less capital is necessary for it than ordinary husbandry. No gardener would think of planting potatoes, carrots, or cabbages in ploughed land, if he could get it dug; for the difference of produce far more than compensates for the difference of expense. By turning up or loosening the ground five or six inches deeper than the plough, which does not ordinarily act on more than three or four inches of soil, there is an opportunity afforded for the descent and diffusion of the roots of plants. If this plan were carried into effect to a moderate extent only, the demand for labour would be augmented at places where it is exuberant; while in case of an insufficiency of hands, the plough would still be used, and the necessity would thus be avoided of sending work-people abroad."

"A freed man having much larger crops than his neighbours, was accused of witchcraft, and brought to trial. He produced in the Forum, a stout daughter and his well constructed iron spades, and other tools, with his oxen, and said, 'These, Romans, are my charms.' He was acquitted."—*Pliny.*

Mr. Blacker's arguments.—"Every small farmer ought to use the spade, for many reasons. It costs but little more, even if he had to hire assistance, and does the business better. In all drill crops, also, by using the spade, he may put in a quicker succession of crops, and have one coming forwards as the other is ripening. In wet seasons, he can dig when he cannot plough; and its value, in turning up stiff clay land in autumn, and exposing the soil to the frost and snow, is scarcely to be imagined; and in all such lands *this plan* should be pursued where no winter crop is put in."

"I am quite sensible of the full value of the plough and harrow—and should fully sanction the small farmer in availing himself of such valuable assistance, but it must be acknowledged, that on a small scale, every thing they can accomplish may be attained with-

PLOUGH AND SPADE: FARNLEY TYAS EXPERIMENT.

out them, by manual labour and industry. The cost is not much more, even if the small farmers have to hire assistance. In drill crops, the spade, the hoe, and the scuffle can be used in wet seasons, when the plough cannot, and a succession of drill crops may be obtained by the use of the spade, such as would be wholly impossible by the use of the plough, which all gardening proves, and this is what cottage farming ought to aspire to."

Mr. Blacker's opinion of a mixed system of Spade and Plough Husbandry.—"In this respect I am quite decided in opinion, that the entire use of manual labour is in small farms much more beneficial than the entire cultivation by horse-work; but a mixed system, where a horse can be got in due season, I should prefer to either; but in *this* lies the difficulty; for it should be remembered, that very often the small occupiers who are obliged to hire horses, are, forced to wait, in order to get their labour performed in that way, until the proper period for doing the work has passed over, to the evident injury of their crops. Whereas, if they had relied upon the spade, which they had at their own command, however slow the work might have appeared to them, it would have been performed in due season, so that they might have reaped the fruit of their industry. It possesses the additional advantage of employing the poor man, at a season when it is difficult to get employment elsewhere."

"With land—with health—with industry—man need never want. The first is the great storehouse of riches—the last the key that opens it—when industry, therefore, is not exercised, the riches of the earth are lying useless and idle. Let him, therefore, who is blessed with the means to help himself to these—use those means with diligence—and from the abundance which his labour creates—take that which will satisfy the wants of himself and family."—*Mr. Thynne.*

Spade Husbandry as a means of diminishing Poors' Rates.—"In 1842, when applications for relief from the distressed manufacturers were overwhelming, and the cry was give us *work*, it is not *charity* we want, "a committee* in the village of Farnley Tyas, near Huddersfield, begged £40 of the Manufacturers' Relief Committee, and procured five acres of land, which these men were paid for cultivating, and after keeping an accurate account of all expenses of rent, &c., as well as money paid for spade labour, the PRODUCE was found to overbalance the outlay, and the £40, which if given like Poor Rates would have sunk the first year, RE-PRODUCED from the soil, afterwards paid the same persons for again cultivating it, evidently showing, that where the HUMBLE BOON is granted of men being allowed to cultivate their native soil, they can be *payers* instead of *receivers* of rates."—*Mrs. Gilbert's Letter, Hereford Journal.* Also see the parliamentary evidence of the Rev. J. M. Maxfield, Chairman of the Huddersfield Board of Guardians.

* Under the direction of the Rev. THOS. MINSTER, M.A.

DR. AND CR. ACCOUNT OF THE INDUSTRIAL FIELD AT
TYAS, FOR THE YEARS 1843, 1844, AND 1845.

By the Treasurer, Mr. Joseph Leigh.

CAPITAL RAISED from the Manufacturers' Relief Committee ..
Private Subscription

FIRST YEAR, 1843.				
Dr.	EXPENDED.	£. s. d.	PRODUCED.	Cr.
For Manual Labour	36	8 3	Potatoes sold	
Farm Yard Manure	11	11 2	Turnips sold	
Carriage of ditto	9	12 6	Oats sold	
Seed Oats	1	3 9	Half Manure on land ...	
Potatoes	6	0 0	(One-third Guano on ditto.	
Rent and Taxes (1 year)	9	3 0	Potatoes reserved for sets	
Guano	1	18 0		
Superintendent's Salary	5	0 0		

80 16 8

Balance, profit.... 2 1 4

£82 18 0

SECOND YEAR, 1844.				
For Manual Labour	25	16 1	Potatoes sold	
Manure and Carriage	10	1 6	Oats sold	
Seed Oats	3	5 7	Straw sold	
Potatoes reserved last year ..	4	11 3		
Cartage of crops	2	14 0		
Sundry small expenses	0	17 8	Quarter of first year's mar	
Rent and Taxes	9	3 6	Half of second ditto	
Superintendent's Salary, five } per cent on £85 4s..... }	3	5 3		
Manure left by 1st year's crop	11	2 0		

70 16 10

Balance, profit.... 4 18 11

£75 15 9

THIRD YEAR, 1845.				
For Manual Labour	17	6 4	Potatoes sold	
Team Work	3	8 0	Potatoes Reserved	
Manure and Carriage	6	7 2	Oats	
Seed Oats, &c.	5	17 2	Wheat	
Rent and Taxes (1 year)	9	3 0		
Potato Sets	2	12 6		
Superintendent's Salary, five } per cent on £55 18s..... }	2	16 0	Quarter of 2nd year's Man	
Manure left by 2nd year's crop	10	11 9	Half of 3rd year's ditto...	

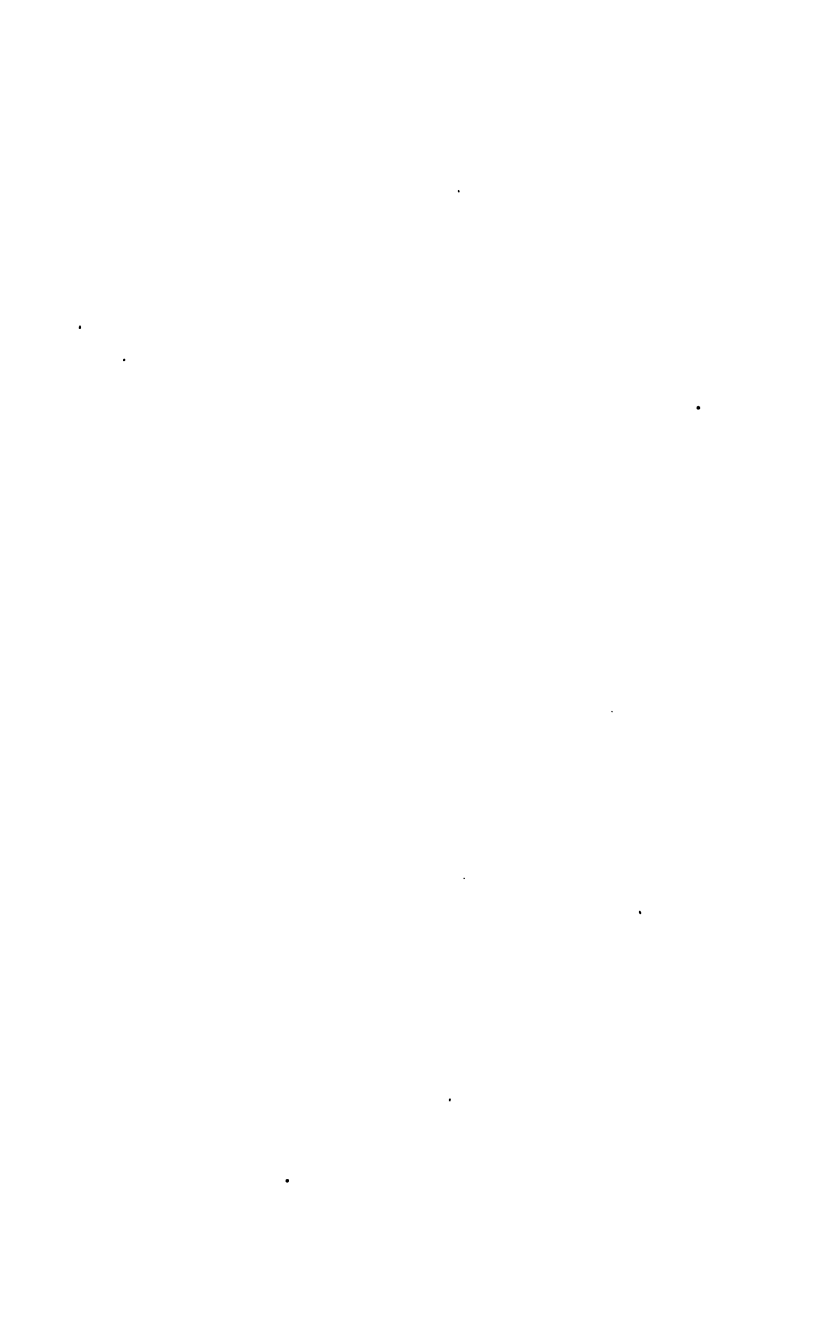
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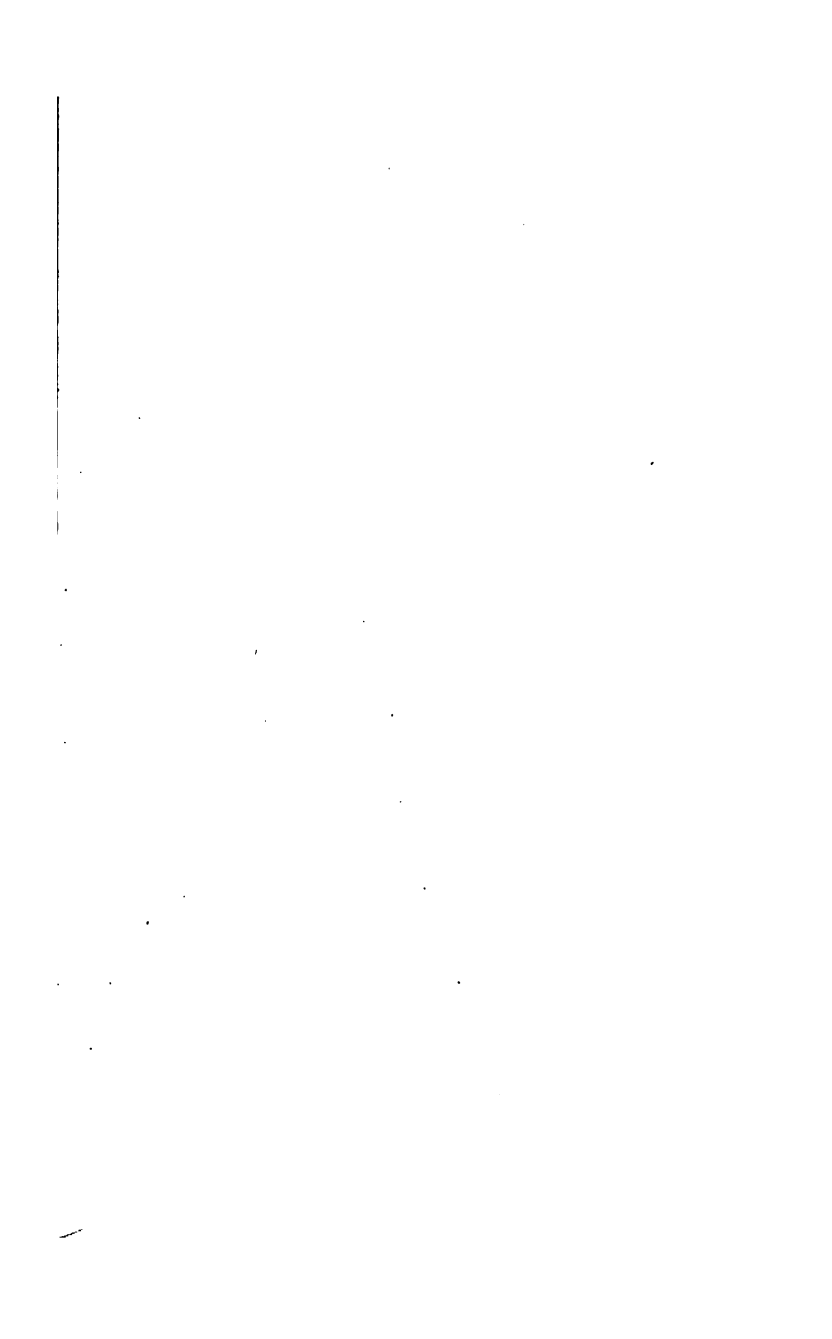
Balance, profit 3 15 2

£61 17 1

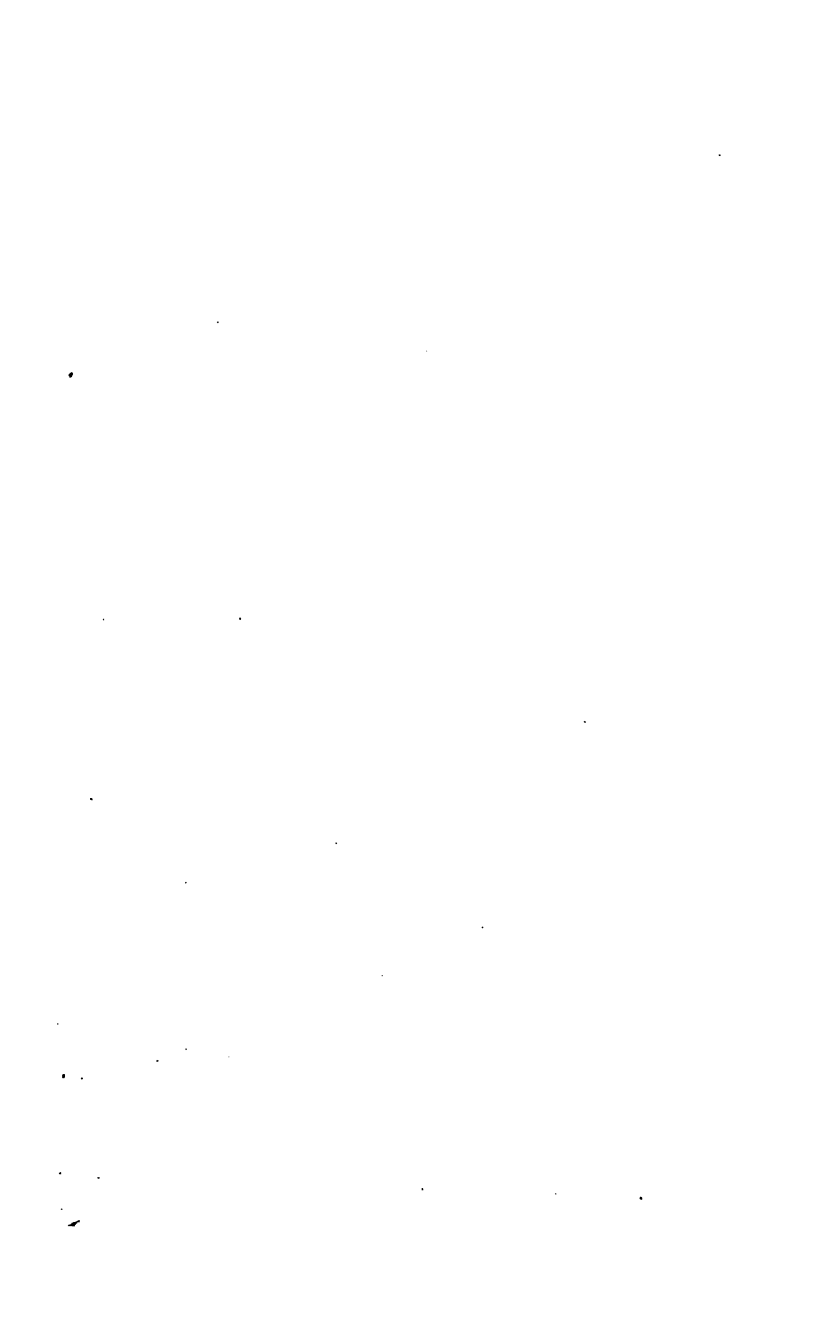
* * Thus, in three years, on a farm of five acres of poor land, the sum of £82 18s. 0d. has been expended in manual labour alone. It has furnished labour, reckoned at 2s. per day, to the unemployed. The original capital at the present time undiminished!! and in addition to it, a clear profit gained of £10 18s. 5d.!!!

T. KEMP, PRINTER, HUDDERSFIELD.









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